

MELTING TEMPERATURES AND THERMAL CONDUCTIVITIES OF POSSIBLE
SUBSTRATES FOR THREE-DIMENSIONAL CONDUCTIVE INK JET PRINTING

by

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The current research project originated from the manufacturing limitations of integrated circuits. In the near-term future, it will not be competitive to use automated machine or hand assembly processes to produce consumer products. It is our contention that such a conceptual process can be rendered obsolete for numerous consumer products. To achieve this, the investigators' goal in ongoing research is to deposit conductive materials onto a multitude of substrates and products using specialized continuous ink-jet (CIJ) print heads.

Currently, electrical conducting materials to provide the equivalent traces of a PCB can be directly deposited on 2-D structural components. Research at the University of Pittsburgh also makes it possible to fabricate various electronic components by the same production process as the conductive elements. The focus of this paper, however, is on the thermodynamic and heat transfer properties of potential substrates that will make 3-D circuit printing possible.

Three substrate materials were considered: Delrin, epoxy/glass composite, and Butter-Board. To overcome issues of curing temperature and component heat release, the melting/breakdown temperature and thermal conductivity value had to be found for each material. Oven curing tests were conducted over predetermined temperature intervals for 1"x1"x1" cubes of each substrate material. After each curing cycle, the test specimens were examined for discoloration, melting, and volume expansion. The results were then used to

specify the design parameters for thermal conductivity testing. A firebrick test block was constructed, and repeatable conductivity tests were completed using a known heat output and experimentally determined temperatures.

In comparing the three materials, it was discovered that epoxy/glass composite possesses the highest melting temperature, at between 275°C and 300°C, and a potentially good thermal conductivity of 0.653 W/m*K. Butter-Board, however, had the lowest of the thermal conductivity values of 0.416 W/m*K, but also exhibited a lower breakdown temperature. Of the three materials, the epoxy/glass composite is the most promising given the current curing temperature requirements of the thermally conductive inks. Future research directions could include investigation of the operational thermal conductivity of the chosen substrate materials, and a comparison of the experimental values with those predicted by finite element modeling.

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CHAPTER I: INTRODUCTION

A very important quality in manufacturing is the ability to develop and produce high quality prototypes and products in short periods of time with automated processes. In order to remain competitive in today's marketplace, this is imperative. This can be achieved in certain electronic products through the use of three-dimensional circuit printing. This process utilizes a specialized continuous ink-jet (CIJ) printing technology and conductive micro- and nanoparticle metallic inks to produce 3-D conductive traces on a variety of substrates, typically forming the product case or enclosure.

A. THREE-DIMENSIONAL CIRCUIT PRINTING

In the CIJ process, conductors and other components can be directly printed on the interior, and possibly even the exterior, of a product's surface. This capability removes the need for printed circuit boards and the associated mounting hardware. This process then allows the electronic components to be directly inserted, and, by filling the rest of the product with an insulating material, a solid product can be formed. Such a product is extremely rugged and can be designed to virtually any shape or application.

The CIJ printing technique generates a continuous stream of conductive silver (or other metallic) droplets that are electrically deflected onto a substrate to produce conductive traces. The piezoelectric orifice is controlled by a constant pressure wave pattern so that the silver-based

solution is broken up into uniformly sized droplets that are evenly spaced. The charged drops are then deflected when they pass through a set of charged deflector plates that generate an electric field. The deflected ink droplets are used to form the trace on the substrate. The excess uncharged droplets are then filtered through the system into a gutter and will then be re-circulated back through the system so that very little ink goes unused [1].

In most cases, the deposited ink must be cured using a thermal process. The curing temperature is directly related to the material properties of the inks, which are dictated by the physical parameters of the CIJ system described in the next subsection. Since the goal of the CIJ printing technique is to produce an integrated device, the thermal properties of the substrate both during the curing process and during operation are also of particular interest. The thermal behavior of the substrate properties is the focus of this thesis, and will be discussed in more detail in section I.D.

B. CIJ PRINTING SYSTEM DESCRIPTION

A multidisciplinary research team at the University of Pittsburgh has constructed a specialized continuous ink-jet (CIJ) system for depositing conductive materials. The system generates a continuous stream of droplets that contain conductive micro and nanoparticles that are electrically deflected onto a substrate to produce conductive traces. The entire system is kept under constant pressure, and contains a reservoir of conductive material that supplies a continuous stream of material to a print head. In this system, as seen in Figure 1, a silver-based solution is broken into droplets of uniform size and spacing by applying a pressure wave pattern to a piezoelectric orifice.

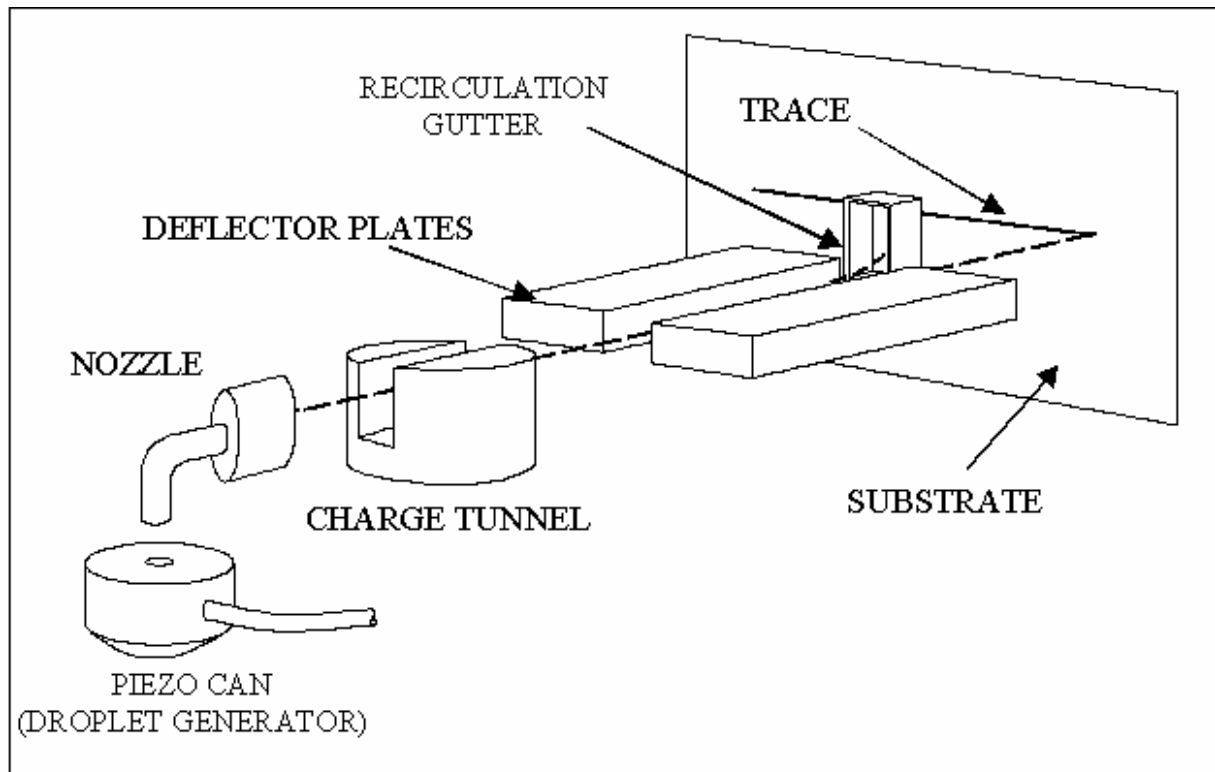


Figure 1: Continuous Ink-Jet System

The piezocan (Figure 2) has been specially designed to oscillate at a known frequency to eject a stream of silver-based droplets through a small nozzle (orifice). Since the base material consists of a metal such as silver, an electric charge is impressed on selected drops as they break off from the orifice and pass through a charge tunnel. The charged drops are then deflected when they pass through a set of deflector plates that generate an electric field. The deflected ink droplets are used to form an image, or trace, onto the substrate. The uncharged droplets are captured by a gutter system that recirculates the silver solution back into the system.

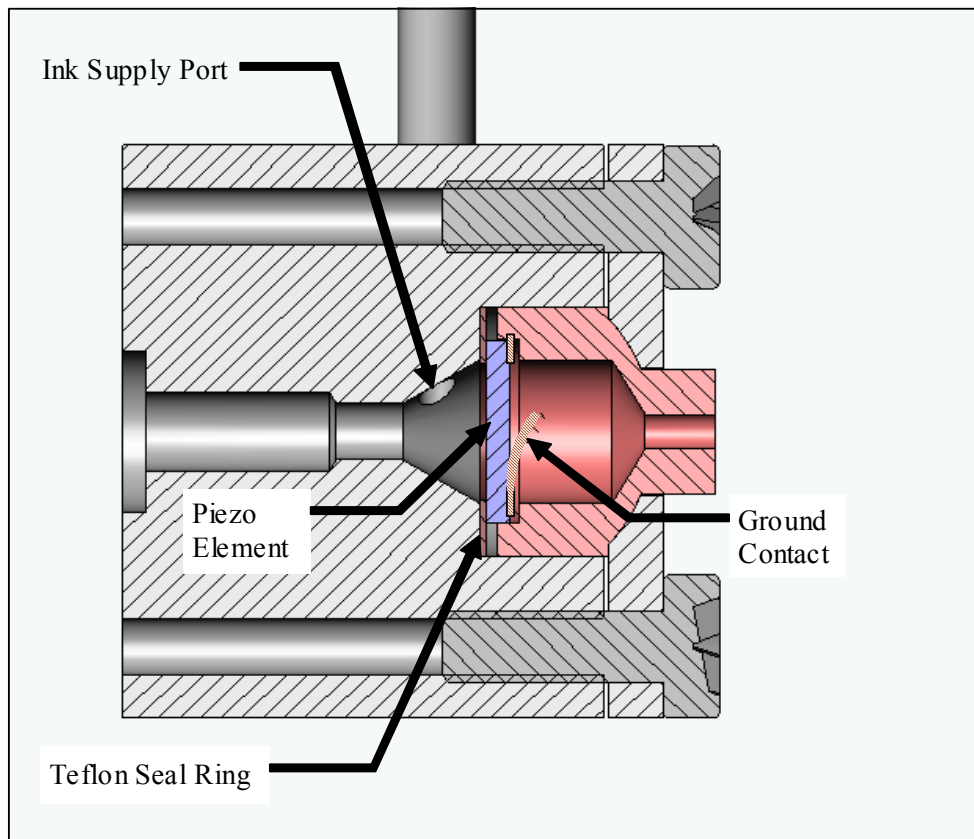


Figure 2: Piezocan

This modular system is currently being used to produce conductive traces on glass and polymers. Several silver-based conductive materials have been developed for printing the conductive traces. These materials can be categorized as micro-scale silver particle solutions, which consist of 5 μm silver particles suspended in acetone with a boron phosphate binder; nano-scale silver particle solutions, which are produced using a reducing agent to create Ag^0 from a silver salt and then controlled in size through the use of Thiol molecules; and soluble silver particle solutions, which use silver ion complex compositions. Overall, the system consists of three major components: (1) a specialized print head, (2) a Matthews CIJ control system, and (3) an Aerotech precision positioning table.

As shown in Figure 3, the constructed print head includes all of the standard mechanical components required for continuous ink-jet printing – a PZT can, a sapphire orifice, a charge tunnel, deflector plates, and a gutter. In the preliminarily designed print head (top view), the charge tunnel was 6 mm in diameter, the deflector plates had base dimensions of 30 mm by 10 mm, and the sapphire orifice was 60 μm in diameter.

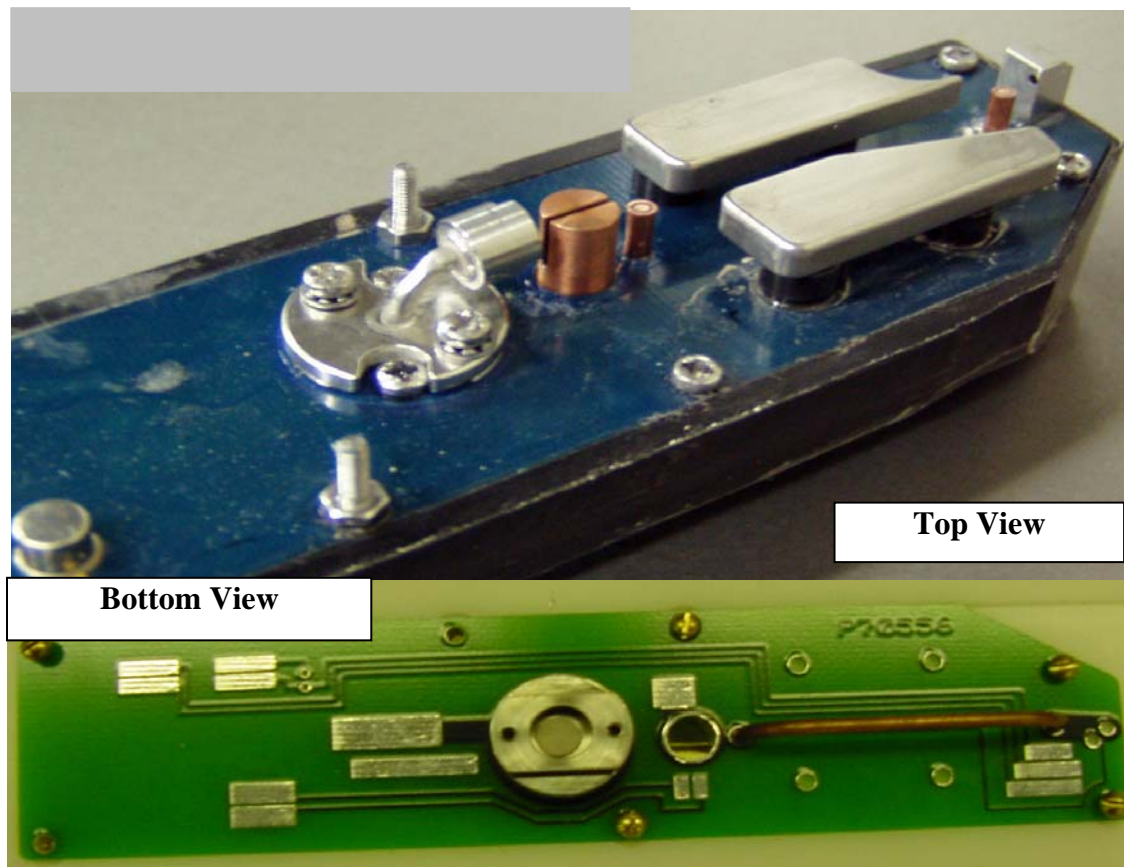


Figure 3: CIJ Print Head

In addition to these mechanical components, the figure shows the underside (bottom view) of the print head, which contains a PCB board and all of the electronic circuitry required to control and generate the droplets. In the print head, the piezo can was 0.8 inches in diameter and included a 0.2 in-diameter PZT element. The control system contains a reservoir for the material being

deposited and allows direct variation of numerous system variables. These variables include the fluid system pressure, the material flow rate, the voltage applied to the PZT crystal (which controls deflection), the vibrating frequency of the PZT crystal, and the electrical properties of the charge tunnel and deflection plates.

The final component of the current experimental CIJ system is a single axis, precision motion table (Figure 4) from Aerotech. The Aerotech positioning table is computer programmable and has an accuracy of 100 nanometers. For the final system, a state-of-the-art three-axis Aerotech table will be used.

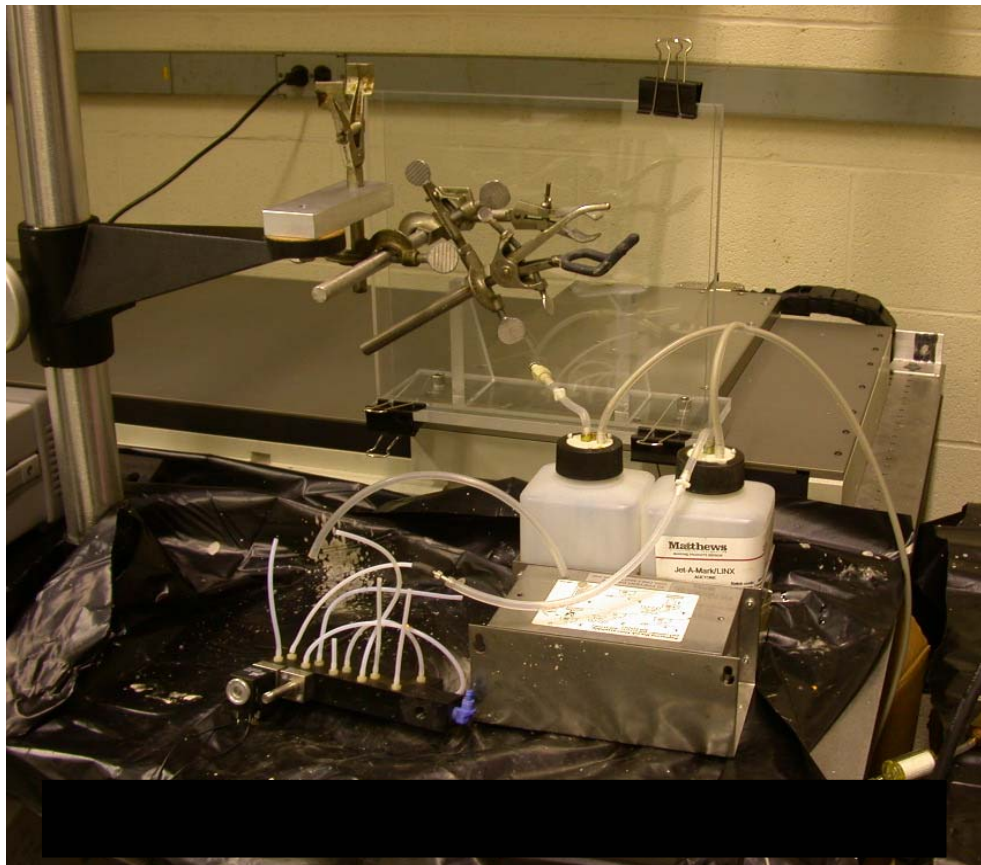


Figure 4: Motion Table and Test Fixtures

C. CIJ PRINTING SYSTEM ADVANTAGES OVER EXISTING PRINTING TECHNOLOGIES

The major advantages of the CIJ process are that it (1) provides a fast and cost-effective method for applying conductive lines on existing products, (2) eliminates the 2-D shape restrictions of current electronic components (i.e. printed circuit boards), (3) increases product design freedom by allowing conductive traces in any orientation of 3-D space, (4) eliminates the need for labor intensive subassemblies, and (5) allows a new design flow where CAD software can be integrated directly into the manufacturing processes of electronic products [2].

Furthermore, previously, the printing of conductive materials onto a substrate has primarily focused on Drop-on-Demand (DOD) technology, which is limited to the two-dimensional domain. The DOD technique has a number of requirements that restrict its ability to be used for printing three-dimensional electronic components: a limited throw distance of less than 1 cm, a flat substrate maintained at a constant distance from the print head, a fixed frequency of droplet ejection, and an inability to react to varying ink viscosity levels.

Unlike DOD technology, a CIJ-based system offers several advantages for printing three-dimensional electronic components. These advantages include:

- (1) **Long throw distance** - In CIJ technology, the ink droplets travel a relatively long distance (at least 10 cm) before being deposited onto the substrate.
- (2) **Ability to control droplets** - In the CIJ technique, ejected droplets are electrically charged after exiting the orifice and later deflected to a specific location on the substrate.

- (3) Ability to tune system** - With a long throw distance, continuous ink jet print heads have time of flight (TOF) sensors that measure the distance between droplets. Based on TOF values, both pressure and viscosity can be tuned to optimize print quality.
- (4) No dependence on gravity** - The CIJ system does not depend on gravity to deposit the conductive material, which allows flexibility in the orientation of the print head.

D. HEAT TRANSFER ISSUES

Despite the advantages of the CIJ process, there remain a number of challenging heat transfer issues that must be addressed during both the operation and fabrication with CIJ printing of the 3-D electronic components. Increasing power requirements and decreasing error margins are already escalating the heat load encountered by traditional 2½-D chips. For the new 3-D electronic components described above, the influence of the metal and substrate material conductivity must be carefully considered, particularly when dealing with intermediate conductivity problems. Additionally, the thermal properties of other materials, such as encapsulant materials and junction temperatures, must also be quantified. Finally, the effect of void spaces on vertical path heat transfer must be analyzed, and a model must be developed that can incorporate both steady-state and transient operation

Even more fundamental heat transfer and material issues are encountered during fabrication of the 3-D components. When utilizing the modified CIJ technique, a substrate material must be selected that can withstand the temperature at which the micro- and

nanoparticle metallic ink is printed and subsequently cured. To properly select a base material, the peak fabrication temperature and curing times for each type of ink must be considered, and then matched to the substrate material's heat capacity, thermal conductivity, maximum service temperature, and deflection temperature.

Currently, substrate materials such as Delrin, epoxy/glass composite, and Butter-Board match many of the desired structural characteristics for the modified CIJ manufacturing technique. Before further steps can be taken with these materials, the thermal characteristics, such as melting and deformation temperatures, must be quantified. All three materials were tested at temperatures from 100-400°C, which is the range at which most conductive micro- and nanoparticle solutions are cured. Comparisons were then made between the materials, and conclusions were drawn as to each material's suitability for 3-D circuit printing [2]. The thermal testing of the substrate materials and the results are discussed in Chapters III and IV, respectively.

Also, due to the nature of the electrical components to be printed and the heat that must be dissipated during operation, the thermal conductivity must be determined for the substrate materials, both before and after the inks applied to the materials are cured. Based on the melting and deformation tests, it was found that the thermal conductivity should be quantified for the epoxy glass composite and Butter-Board. In 1998, Haji-Sheikh et al. found that values of thermal conductivity could fluctuate due to variations in the manufacturing of a material, but did not quantify this variation with respect to the cure temperature [3]. Ideally the thermal conductivity should be low, so that when components run at high temperatures, the substrate material that is close to the user's interface stays cool. Also, this provides a clear means to quantify other outlets (both passive and active) for heat dissipation and cooling of the electrical components [1]. A

description of the thermal conductivity testing and the results for both substrate materials are presented in Chapters III and IV.

CHAPTER II: LITERATURE REVIEW OF POTENTIAL SUBSTRATE PROPERTIES

Certain thermal characteristics of both Delrin and epoxy/glass composite have been investigated in the literature. Very little information, however, can be found in the literature for Butter-Board, most likely because it was developed recently.

A. DELRIN

Delrin is an acetal resin that was patented by DuPont in 1956. It has been used for a variety of purposes, such as bearings, pump components, and joint prostheses. In 1985, it was observed that the stress-strain properties of Delrin varied depending on the cure temperature, and that the melting point of Delrin fell between 165-175°C [4]. In 1998, Haji-Sheikh et al. found that the thermal diffusivity of Delrin was approximately $0.175 \times 10^{-6} \text{ m}^2/\text{s}$ and the thermal conductivity was approximately 0.35 W/m·K at room temperature. They stated that these values could fluctuate due to variations in the manufacturing of the material, but did not quantify this variation with respect to the cure temperature [3]. Additional research into the thermal properties of Delrin has found the melting temperature to be an average of 179°C, but also be a distinctly structure sensitive property [5]. That study used thermo-optical analysis to examine the sample, and increased the temperature at a rate ranging from 10 to 0.2°C per minute until the sample melted. None of these studies examined the effect of prolonged constant temperature heating on the material.

B. EPOXY/GLASS COMPOSITE

More comprehensive testing has been completed for the epoxy/glass composite material, which consists of thin layers of glass held together with resin. DeMeuse et al. found that the rigidity of epoxy/glass composite varied considerably between a temperature of 275°C and a temperature of 300°C [6]. Additionally, the glass transition temperature was found to vary almost linearly with the maximum heating temperature, but no other thermal properties were found or calculated. Egusa et al. looked at lower-temperature behavior, and demonstrated that the variance in material behavior was quite large: between 77 K, room temperature, and 220°C, respectively [7]. Again, however, that paper focused on the variation of structural properties, such as Young's modulus, rather than thermal properties.

Raghava examined the coefficient of thermal expansion for a number of unidirectional glass/epoxy laminates, and found that it varied depending on the nominal fiber volume [8]. For each type of sample, the coefficient of thermal expansion linearly increased with temperature from 20 to 100°C. Bailleul et al. attempted to correlate the specific heat and thermal conductivity to the rate of cure, and increased the peak of the examined temperature ranges up to 190°C [9]. However, they did not examine the effect of reheating previously cured resins. They found that the specific heat was a nearly linear function of temperature, but with some disjoint jumps in the overall value around the glass transition temperature. The thermal conductivity was also found to vary with temperature in a linear fashion. Finally, recently, Garnier and Sommer have also attempted to quantify the thermal properties of epoxy-glass composites as functions of not only the temperature, but also the state of the cure [10]. They found that heat capacity changes are minor, while thermal diffusivity measurements demonstrate striking and nonlinear variations. Garnier and Sommer also found that the thickness of the material can have a significant effect

on the variation of the thermal properties during the cure, so they tested samples with a thickness lower than 3 mm at temperatures ranging from 109°C to 129°C.

C. BUTTER-BOARD

Butter-Board is a machineable plastic, and is generally used for making patterns and prototypes, and for thermoforming tools. According to the manufacturer, its behavior is comparable to materials such as R1/HG3000 and R1/M15.2 [11]. However, no specific thermal properties of Butter-Board were given by the manufacturer, nor, as stated previously, could any thermal testing or property information be found in the literature.

CHAPTER III: EXPERIMENTAL SETUP AND PRODCEDURE

In order to compare the behavior of the three substrate materials at temperatures relevant to the modified CIJ manufacturing technique, timed thermal testing was completed for each material. Sheets of white Delrin Acetal copolymer plate, G-10/FR-4 epoxy/glass composite, and Butter-Board were purchased, and then cut into 1"x1"x1" cubes. Ten cubes were cut from each respective sheet in order to provide as large a degree of structural uniformity as possible for the testing of each material.

A. MELTING TEMPERATURE TESTING

A new sample was used for each test. A glass slide would be placed into the oven while the oven was preheated to the specified temperature. This was done to ensure that all areas of the oven were at the same temperature. Once the oven was heated to the specified temperature, the sample was placed into the center of the oven on top of the glass slide. The sample would then cure in the oven for 30 minutes.

The first temperature that was tested was 100°C. If no physical changes could be measured in the material, an increment of 100°C would then be applied (thus the next temperature to be tested would be 200°C, then 300°C, etc.). When physical changes to a sample were observed, a subsequent test would then be conducted at the halfway point between the breakdown temperature and the previously tested temperature. For example, if a material showed

no change at 200°C, but melted, expanded, or changed color at 300°C, then the next testing temperature was 250°C. After this halfway point temperature had been tested, the next step was to test at a 25°C increment. So, for the same example, if the material changed in some manner at 250°C, the next testing temperature was 225°C. Similarly, if the material didn't change at 250°C, then 275°C would be tested. This allowed the melting/break down temperature to be determined within a 25°C domain for each type of material [2].

The results of the melting temperature and deformation testing are presented in the next chapter, and were used to define the appropriate experimental parameters for the thermal conductivity testing.

B. THERMAL CONDUCTIVITY EXPERIMENTAL DESIGN SETUP

To accurately measure the thermal conductivity of epoxy glass composite and Butter-Board materials that will be used in 3-D electronic printing, a test procedure was derived from the ASTM C201 standard [12]. For this purpose, an entire apparatus to contain the samples was created using firebrick, a known engineering insulation material that has a very low thermal conductivity of 0.13 W/m*K [13]. This material was specifically chosen so that all of the heat and thermal properties would be focused on the substrate test samples. As shown in Figure 5, the apparatus was created with a rectangular volume of the firebrick material from which two 1"x 1"x 1.5" sections were removed with a skill saw. Then, on the sides, another single cut was made to flatten out the bottom of the square tunnel.



Figure 5: Insulated Firebrick Assembly

Two 1"x 1" Omega Kapton insulated flexible heaters, which could be run at 28V and a maximum power output of 10 W/in² [14], were placed at the bottom of each of the square tunnels, while the connective wiring fed out through the side slits. A 1"x 1" thin plate of copper was placed on top of the heater to ensure that the sample specimen would come into full contact with the desired heat flux. In the copper plates, a thin 0.5" slit was cut to allow a thermocouple wire to be fed in and attached to the test sample. An open and closed assembly can be seen in Figures 6 and 7, respectively.

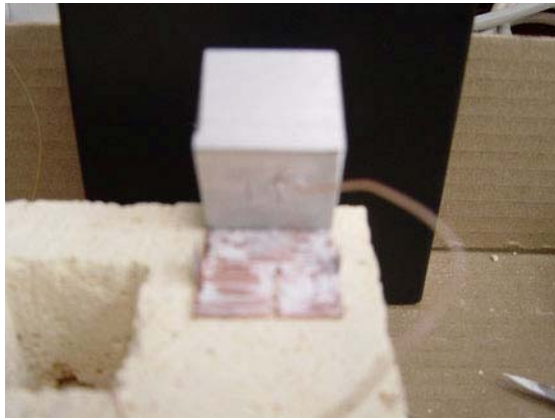


Figure 6: Open Copper Plate

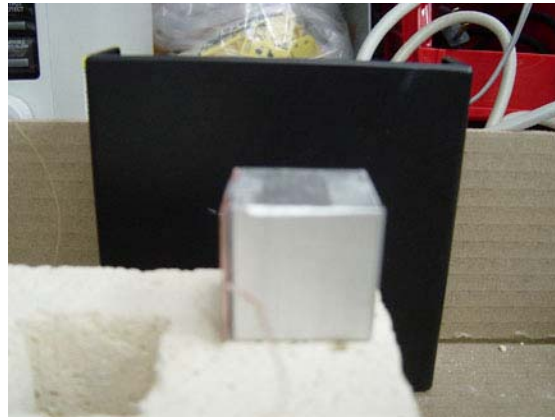


Figure 7: Closed Copper Plate

C. THERMAL CONDUCTIVITY TEST PREPARATIONS

For all of the samples, the thermocouples were taped to the test specimens with aluminum tape to ensure accurate temperature readings (as opposed to, for example, duct tape, which is an insulator). The bottom thermocouple was taped to the specimen, and then run through the groove in the copper plate. To then ensure that no air was present between the copper plate and the test sample, a very thin layer of thermal grease was spread across the copper plate and placed in contact with the test sample. Aluminum tape was then used once again to hold the copper plate to the test sample. Finally, the copper plate and sample were lowered into the 1"x 1" slots to be in direct contact with the heater.

The heaters were connected to a power source in parallel to ensure that both heaters received the same amount of power. As a backup regulator, a multimeter was hooked up to the system to measure the voltage and current to each heater. This comprehensive setup can be seen in the diagram of Figure 8. When the power source was set to 13.5V and 0.16A, two multimeters were used to display the current and the voltage being supplied to the heaters. The

multimeters showed that the heaters were receiving 12V and 0.08A each, and thus a power of 0.96 W was supplied to each heater.

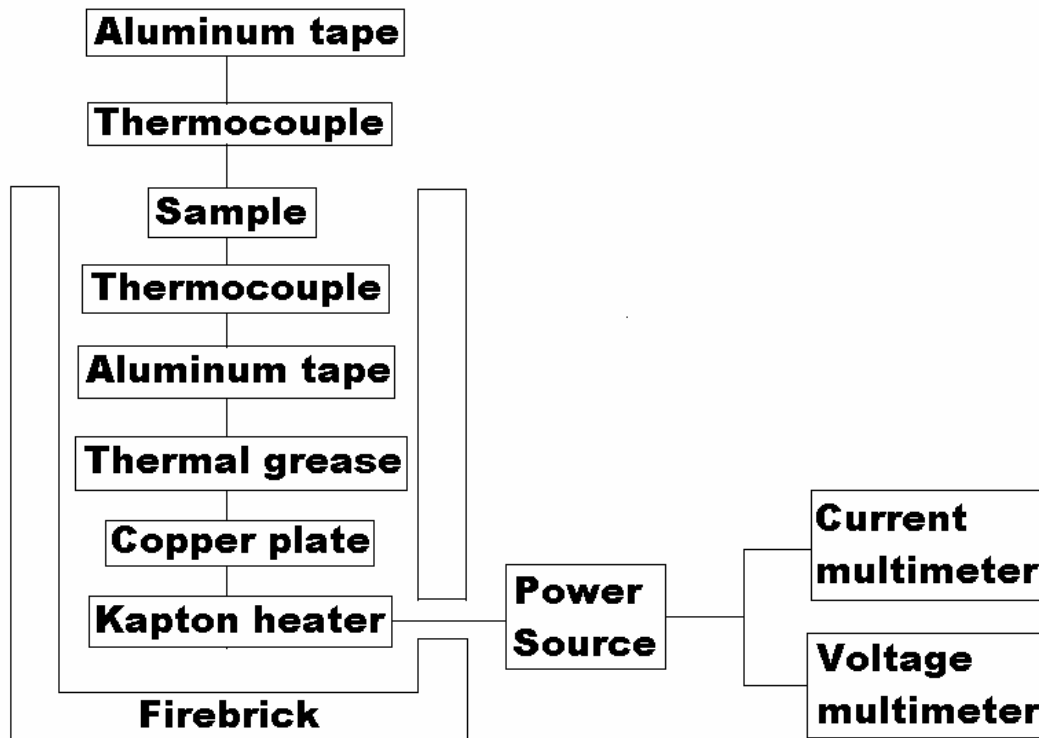


Figure 8: Comprehensive Test Sample Setup

To ascertain the accuracy of the testing apparatus, the thermal conductivity of two aluminum samples were initially measured by the system. The thermal conductivity of aluminum is known to be $151 \text{ W/m}^{\circ}\text{K}$ [15]. In the tests, a 1" cube of aluminum was tested in each of the insulated square tunnels in the firebrick apparatus. When each heater was run at 0.96 W, the temperature difference between the top and bottom surfaces for the aluminum samples were both 0.5°C . The heaters radiate heat from both sides, thus giving a heat flux of 0.48 W/in^2 . The equation for thermal conductivity is as follows:

$$q'' = k \Delta T / (39.3701L) \quad (1)$$

where q'' is the heat flux (W/in^2), k is the thermal conductivity ($\text{W/m}^*\text{K}$), ΔT is the difference in temperature ($^{\circ}\text{C}$ or K), and L is the length of the block (in).

In results from the preliminary test, ΔT was experimentally found to be 0.5°C , which confirmed that our test setup was accurate to within 0.375°C for ΔT to the known thermal conductivity value of aluminum. Data results for the aluminum tests can be found in Appendix A. Since Butter-Board and epoxy/glass composite are both insulators rather than conductors, the test setup will be accurate for our needs, since the accuracy of the results will improve with the insulating levels of the substrate material. This was expected because the testing apparatus was specifically designed to follow ASTM C201 [4], which is designed for insulative materials.

D. THERMAL CONDUCTIVITY SAMPLE TESTING PROCEDURE

Each sample was identically prepared as described above (with respect to the heater power, copper plate, thermocouple connection, thermal grease). Five samples of epoxy/glass composite and five samples of Butter-Board were tested. The five samples of the epoxy/glass composite included an uncured sample and specimens cured at 100°C , 200°C , 250°C , and 275°C . Because epoxy/glass composite is made in layers, both orientations were tested to see if the thermal conductivity varied. The five samples of Butter-Board were an uncured sample, and specimens cured at the same temperatures. Again, these are the same samples that were obtained from the previous melting temperature experiments.

Each sample was placed in the test assembly and examined at the prescribed operating conditions described above. Each epoxy/glass composite sample was tested twice (once for each orientation). The results of the thermal conductivity testing are presented in the next chapter.

CHAPTER IV: RESULTS

A. MELTING TEMPERATURE RESULTS

The comparative results of the thermal tests can be seen in Figure 9. For Delrin, which is also shown in profile in Figure 10, it can be seen that melting begins to occur between 200 and 225°C, and has advanced considerably by 250°C. At 300°C, the structure of the Delrin sample is completely destroyed. These temperatures are considerably higher than the melting temperature of 179°C found in [5]. When compared to epoxy/glass composite and Butter-Board, Delrin exhibited the lowest thermal reaction temperature.



Figure 9: Physical Changes for Epoxy/Glass Composite, Butter-Board, and Delrin

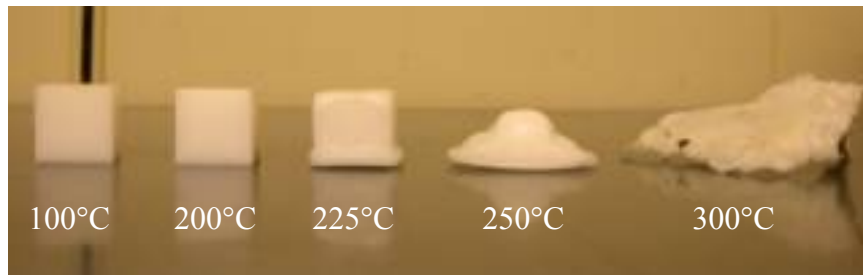


Figure 10: Delrin From 100 to 300°C

As seen in Figures 9 and 11, the epoxy/glass composite material began to discolor at 250°C (a trend which continued at 275°C), but did not exhibit a serious structural breakdown until 300°C. Though two tests were run for epoxy/glass at 300°C, both gave different results. One test was only discolored, while the other broke down completely. This can be attributed to the different qualities of epoxy/glass composite that are available. By 400°C, the layers of resin had completely melted, and the sample lost all resemblance to its original shape. These results confirm the results given in [6], but also provide further visual clarification of the physical nature of the thermal variation.

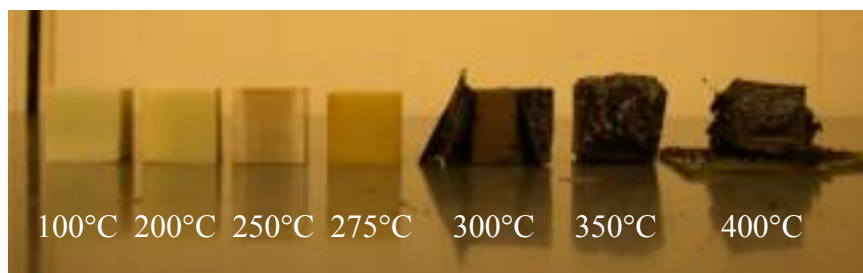


Figure 11: Epoxy/Glass Composite From 100 to 400°C

Finally, the reaction of the Butter-Board to the higher-temperature tests was unique among the materials. As can be observed from Figures 9 and 12, the Butter-Board began to discolor at a lower temperature (200°C) than the other materials, but did not melt as the

temperature increased. Instead, the shape of the sample was largely maintained while the volume increased. The magnitude of this increase is given in Table 1, while the graphic representation can be seen in Figure 13.

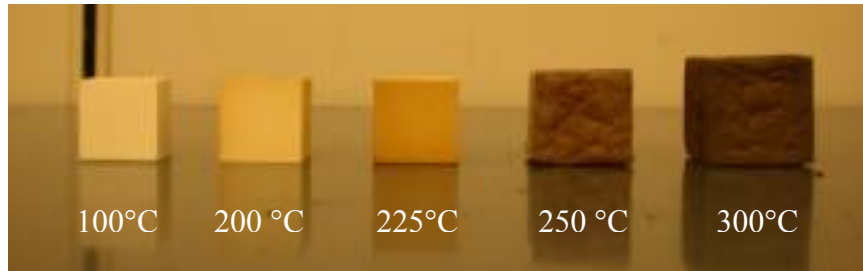


Figure 12: Butter-Board From 100 to 300°C

Table 1: Volumetric Change of Butter-Board Material

Temperature (°C)	Volume (in³)	Percent Increase (%)	Rate of Increase (in³/°C)
100	1	-	-
200	1.141	14.1	0.00141
225	1.174	2.9	0.00132
250	1.816	54.7	0.02568
300	2.521	38.8	0.0141

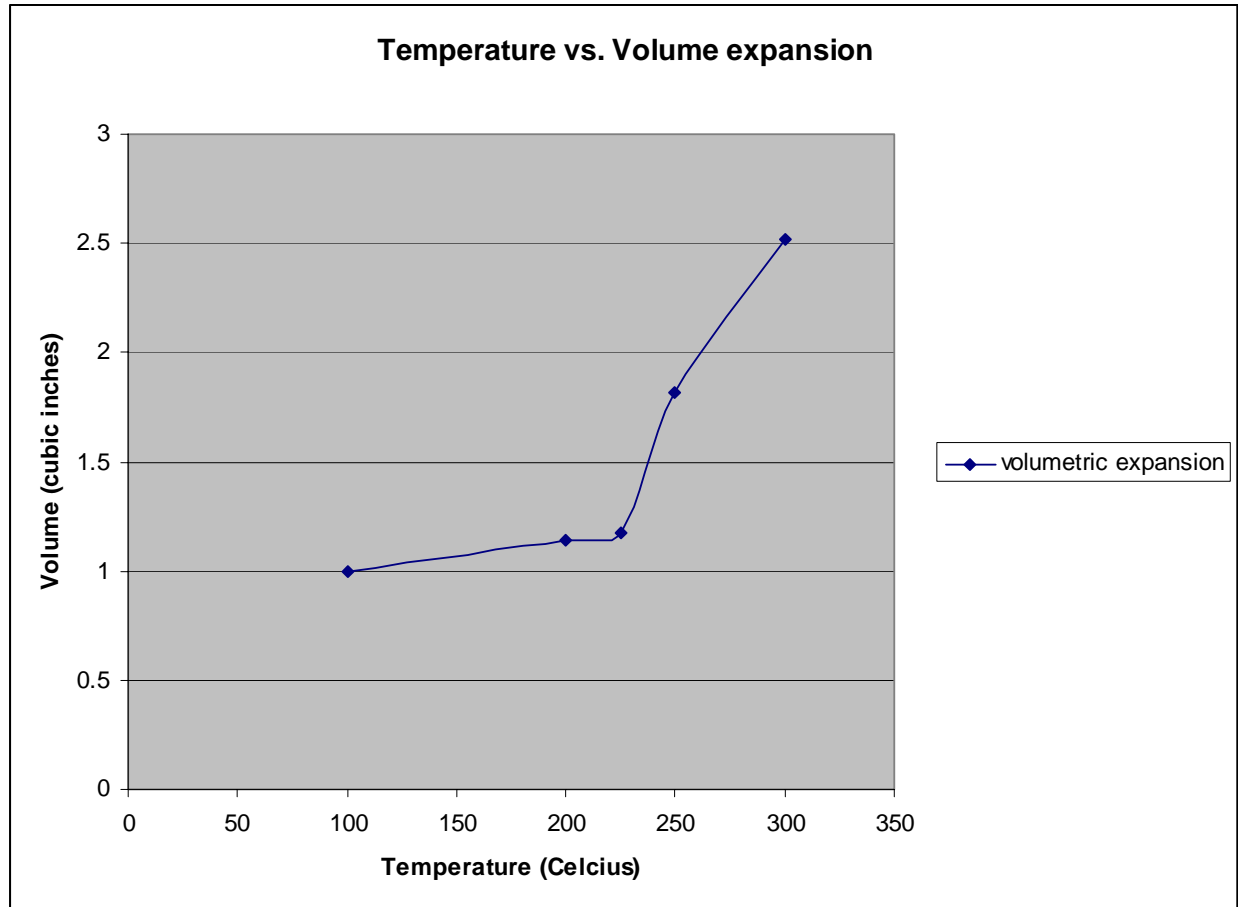


Figure 13: Temperature vs. Volumetric Expansion for Butter-Board

The highest rate of volumetric growth occurred between 225 and 250°C. While the volume continued to increase beyond 250°C, the rate of change decreased, suggesting that the properties of Butter-Board are most significantly altered at around 250°C. Given the lack of thermal data in the literature, further research into the properties of Butter-Board would obviously prove useful.

B. THERMAL CONDUCTIVITY RESULTS

With the use of the firebrick assembly mentioned in section III.C, each test sample was placed in the insulated tunnels while a heat flux passed through them, thus allowing a

temperature differential to be measured by the means of thermocouples located at either side of the sample. These results can be seen in Table 2.

Table 2: Temperature Differences and Calculated Thermal Conductivities

Material	Orientation	Cure Temperature Celsius	Delta Temperature Celsius	Thermal Conductivity W/m*K
Butter-Board		Uncured	58.2	0.41
		100	58.0	0.42
		150	55.1	0.43
		200	60	0.40
		225	55.7	0.43
Epoxy/Glass Composite	Through Layers	Uncured	36.6	0.65
		100	38.0	0.63
		200	36.6	0.65
		250	36.4	0.66
		275	35.0	0.68
	Parallel To Layers	Uncured	30.8	0.78
		100	32.7	0.73
		200	29.5	0.81
		250	30.5	0.78
		275	30.2	0.79

From these results, it is found that the average temperature difference is 57.4°C for the butter-board, 36.5°C for the epoxy/glass composite tested through the layers, and 30.7°C for the epoxy/glass composite tested parallel to the layers. This data can be found in Appendices B, C, and D, respectively. The thermal conductivity (k) was obtained from these values by using Eq. 1. The heat flux is slightly different than that which was used with the aluminum sample. The heat flux for the test sample experiments was 0.61 W/in². The average heat thermal conductivity coefficients are 0.42 W/m*K for the butter-board, 0.65 W/m*K for the epoxy/glass composite with the heat flux oriented through the layers, and 0.78 W/m*K for the epoxy/glass composite with the heat flux oriented parallel to the layers.

When looking at the individual results for each material type, it can be seen that the Butter-Board's thermal conductivity only varied from 0.40 to 0.43 W/m*K, corresponding to an error margin of 4.3°C. The epoxy/glass composite with the heat flux through the layers varied from 0.63 to 0.68 W/m*K, corresponding to an error margin of 3.0°C. Also the heat flux parallel to the layers varied from 0.73 to 0.81 W/m*K, corresponding to an error margin of 3.2°C. No one material had a difference of thermal conductivity greater than 0.08 W/m*K (which corresponds to the epoxy/glass composite with heat flux parallel to the layers). Thus, it appears that curing temperature does not greatly affect the conductivity of the materials examined. The variation in temperature over time for the testing of the Butter-Board and epoxy/glass composite uncured substrates can be seen in Figures 14 and 15.

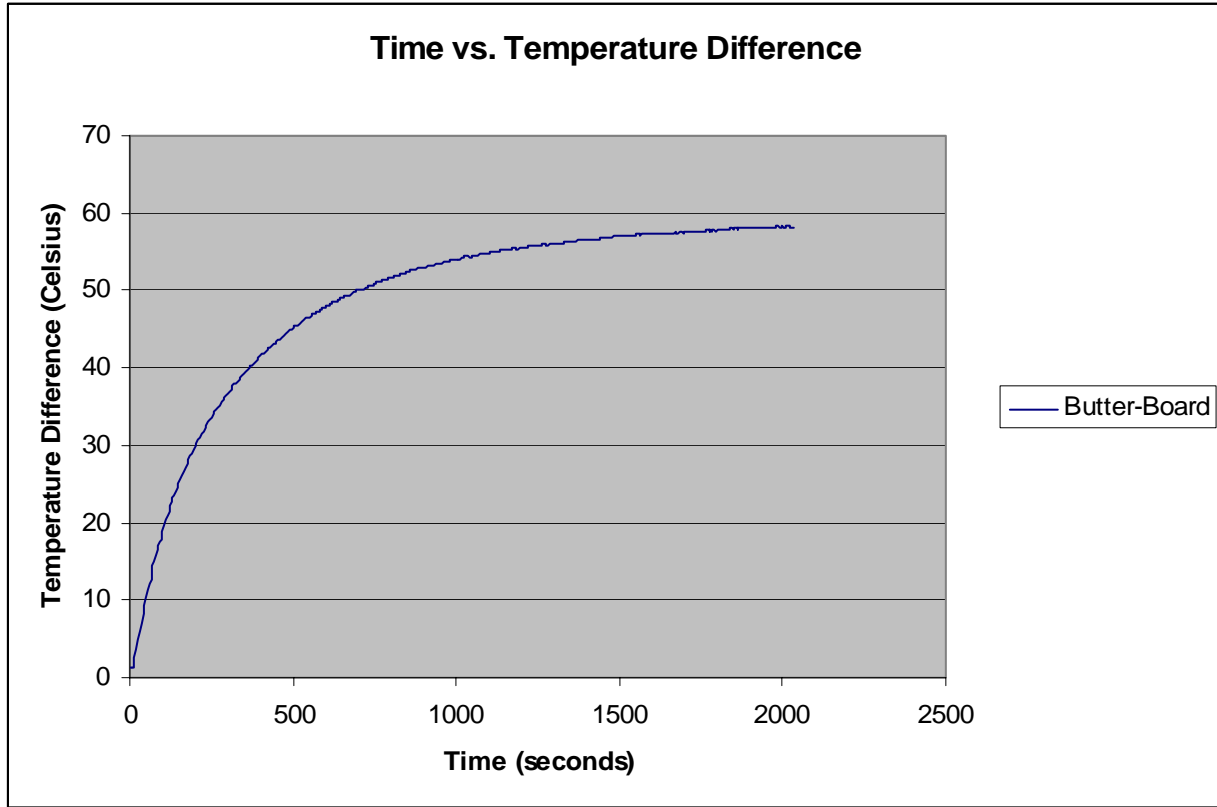


Figure 14: Time vs. Temperature Difference for Butter-Board

It can be seen that inherent variations in the accuracy of the power source and the thermocouples caused small fluctuations in the temperature difference across the samples once steady-state conditions were reached. The uncured Delrin test specimen exhibited the largest measurement instabilities, with a temperature variation of 1.96°C . This corresponds to a potential error margin in the thermal conductivity of $0.03 \text{ W/m}\cdot\text{K}$, or an approximately 6% variation around the average value of $0.46 \text{ W/m}\cdot\text{K}$. A further discussion of the thermal conductivity properties of Delrin can be found below in section IV.C.2. Both the uncured epoxy/glass composite and the Butter-Board test specimens exhibited much smaller temperature fluctuations of 0.3°C and 0.36°C , respectively. These fluctuations correlate to an error margin of $0.005 \text{ W/m}\cdot\text{K}$ for the epoxy/glass composite, and $0.003 \text{ W/m}\cdot\text{K}$ for the Butter-Board.

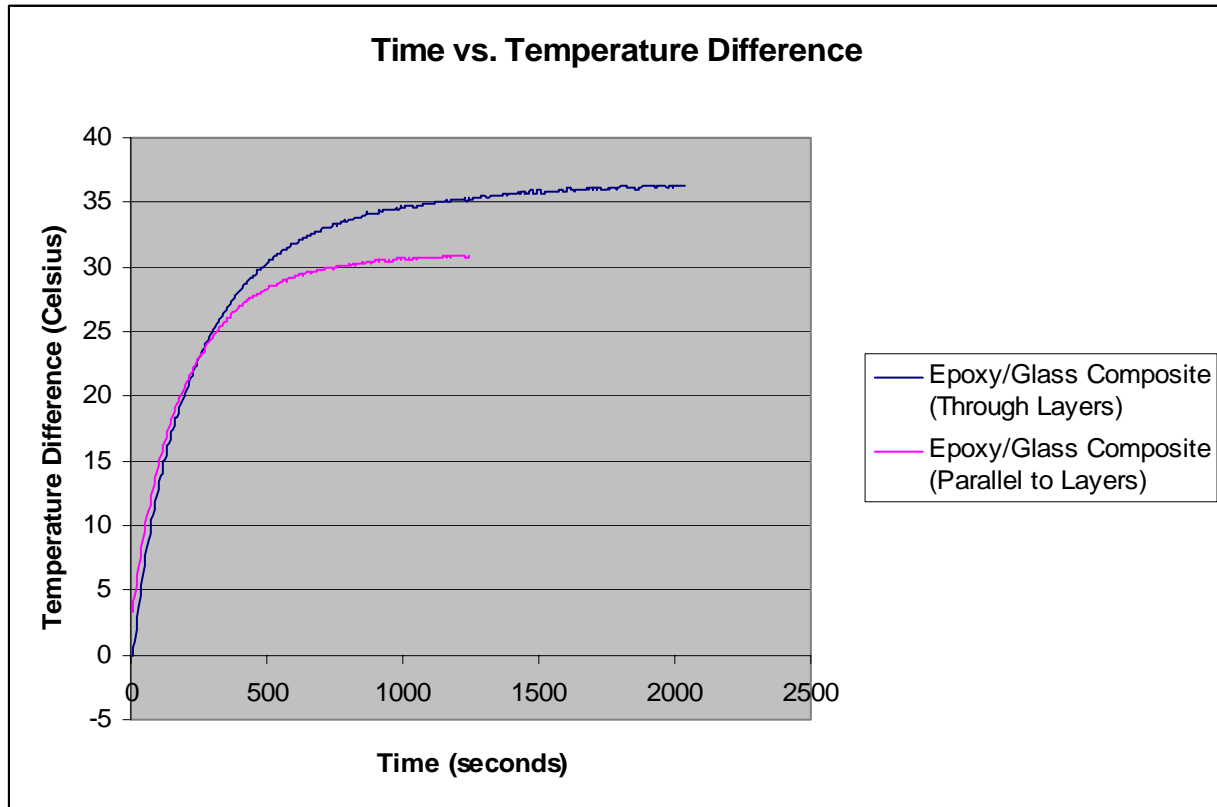


Figure 15: Time vs. Temperature Difference for Epoxy/Glass Composite

When first running the conductivity experiments, it was noted that the bottom temperature of the epoxy/glass composite was significantly lower than the Butter-Board. This showed that the Butter-Board has a lower thermal conductivity (greater ΔT) than the epoxy/glass composite. The temperature near the heat source on the epoxy/glass composite is lower because it absorbs the heat quicker than the Butter-Board. The Butter-Board's temperature near the heat source was high because not as much heat was being absorbed into the sample as with the epoxy/glass composite. It was also noted that even though the sample was placed at the exact same settings as the aluminum, the power increased from the power source. In addition, throughout all of the experiments, fluctuations in temperature began to occur at around 33°C for

the epoxy/glass composite and around 54°C for the Butter-Board. This also proves that there is good repeatability in the results obtained.

C. EXTENSIVE RESULTS

1. Butter-Board

Once all of the relevant epoxy/glass composite and Butter-Board samples were tested, it was then of interest to also test one of the cured Butter-Board samples, since its volume had changed due to the curing temperature. The volume expansion can be seen back in Figure 12, the results of the temperature difference and thermal conductivity are given in Table 3, and the experimental data can be found in Appendix B.

Table 3: Butter-Board Cured at 300°C

Material	Cure Temperature Celsius	Delta Temperature Celsius	Thermal Conductivity W/m*K
Butter-board	300	62.7	0.22

The butter-board sample that was cured at 300°C had a volume increase from 1 in³ to 2.521 in³ [1]. Because of this volumetric change that took place as a result of the curing process, the firebrick insulation assembly had one of its 1”x 1” tunnels enlarged for the conductivity testing. This was done again by using a skill saw to make the tunnel slightly bigger so the sample could narrowly be placed inside. When testing for the temperature difference between

the two surfaces, the enlarged sample was placed at the same operating temperatures mentioned previously. For this test, although the power supply was set to the same level, the multimeters showed an output of 10.1V and 0.14A (0.07A to each heater). With these operating conditions, it was found that the thermal conductivity of the Butter-Board with a large volumetric change had a value of half of its original counterpart. This was due to the expansion in volume, for which more air is present in the material. In general, the less dense a material, the better an insulator it will be.

2. Delrin

The Delrin samples that had no melting temperature effects were then tested for their thermal conductivities. As with the 300°C Butter-Board conductivity test, the power supply was set at 13.5V and 0.18A, yet functioned at 10.1V and 0.14A (0.07A to each heater). Table 4 contains the results for the Delrin test samples

Table 4: Delrin Temperature Differences and Calculated Thermal Conductivities

Material	Cure Temperature Celsius	Delta Temperature Celsius	Thermal Conductivity W/m*K
Delrin	Uncured	31	.45
	100	33	.42
	200	27.4	.51

From these results, it is found that the average temperature difference is 30.47°C, thus corresponding to an average thermal conductivity of 0.46 W/m*K. The Delrin had a error

margin of 5.9°C for ΔT , thus corresponding to a 0.09 W/m*K differential in the thermal conductivity. The experimental data for Delrin can be found in Appendix E and the temperature difference for the uncured substrates can be seen in Figure 16. Since Delrin is commonly used in applications, the thermal conductivity was easily found for a number of acetal based polymers. The specific Delrin used in this test was manufactured by DuPont, and is labeled an acetal copolymer. DuPont however had no thermal conductivity value logged for this specific material. However, an Internet search yielded thermal conductivity values for an acetal copolymer reinforced and delrin acetal homopolymer. Those thermal conductivity values were 0.31 W/m*K and 0.36 W/m*K, respectively [15]. The differences between these values and the calculated thermal conductivity can be partially attributed to Delrin's specific chemical composition and manufacturing process.

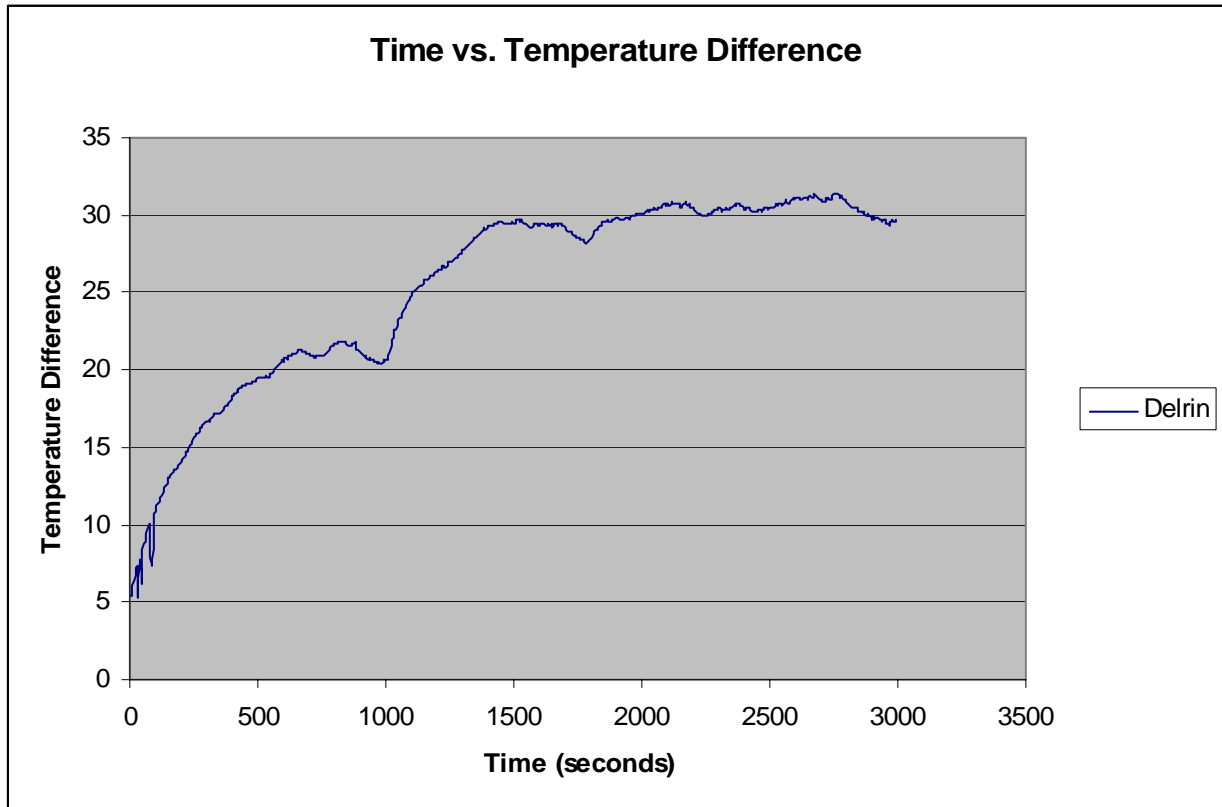


Figure 16: Time vs. Temperature Difference for Delrin

CHAPTER V: SUMMARY AND CONCLUSIONS

A. SUMMARY AND ANALYSIS

Analyzing the melting temperature testing, it can be concluded that the epoxy/glass composite possesses the highest melting temperature of the three materials tested, with a melting temperature between 275°C and 300°C. Butter-Board then follows, with a breakdown temperature between 225°C and 250°C, while Delrin exhibits the lowest temperature, between 200°C and 225°C. Due to the fact that the curing temperature is high (even though it is in the process of being lowered somewhat through experimental ink fabrication and testing), the epoxy/glass composite shows the most promise for the 3-D ink jet application.

After the melting/breakdown temperature experiments were conducted, those exact test samples were used to see if the thermal conductivity of each material varied due to the curing temperature. In the cases of the epoxy/glass composite and Delrin samples, the thermal conductivity did not vary. The average heat thermal conductivity coefficients were found to be 0.65 W/m*K for the epoxy/glass composite with the heat flux oriented through the layers, and 0.78 W/m*K for the epoxy/glass composite with the heat flux oriented parallel to the layers. Thus, if epoxy/glass composite were to be ultimately used as a substrate material, printing would be done on the layers. Delrin, however, had a lower thermal conductivity, with an average value of 0.46 W/m*K. Lastly, Butter-Board showed no significant thermal conductivity changes with the curing samples that had little to no volumetric change. The average value obtained is the

lowest of all three materials types and is found to be $0.42 \text{ W/m}^{\circ}\text{K}$. When the volume of the Butter-Board test specimen increased, the thermal conductivity was decreased. This is to be expected, since the larger Butter-Board test specimen contains a greater volume of air, which is an insulator. With Butter-Board's low thermal conductivity value, it can be beneficial to use if the curing temperature of the ink can be substantially lowered.

B. APPLICATIONS

Numerous relatively low cost commercial products require electronic components that are typically mounted on subassemblies that are produced in a series of manufacturing steps that involve some level of manual construction. Since each layer of the PCB is built in two-dimensional space and connected through vertically conducting elements called vias, a PCB is a 2.5 dimensional implementation. Fundamentally, the electronics considerably bound the possible shape of the concluding product. Due to this constraint, any change in design directly reflects into an increased retail price.

Research at the Swanson Center for Product Innovation (SCPI) at the University of Pittsburgh has led to the concept of printing conductors and conductive mounting patterns directly on the products themselves. This concept is similar to a conformable substrate that can be bent to fit certain spaces. The base substrate for the conductors would become the product surfaces and the conductors themselves would be directly printed on the interior (and possibly exterior) surfaces. Such capability removes the need for printed circuit boards and the associated mounting hardware. The electronic components could be automatically embedded, leading to the possibility of a fully automated product with integrated electronic circuitry. To form a solid

product, the circuitry and components are to be covered with an insulating material. Such a product would possess extremely rugged properties and could be designed to a shape that is aesthetically pleasing. Ultimately, the goal is to be able to entirely design a product using CAD software and then download the design into an integrated manufacturing process without the need for human intervention and costly robotic-type assembly.

Historically, epoxy/glass composite has been the base material for circuit boards, primarily because of the original process by which components were connected to the substrates. This new 3-D printing process will allow a wider range of materials, such as Butter-Board, to be used if the curing process temperature can be sufficiently lowered. Not only does Butter-Board possess a lower thermal conductivity than epoxy/glass composite, but it is also more RF friendly, which is an important consideration in the design of state-of-the-art electronic components

C. FUTURE RESEARCH DIRECTIONS

Now that substrates have been tested for melting/breakdown temperature and thermal conductivity, the next step is to complete conductivity testing for integrated circuits. This will allow us to see how much heat is given off by individual components and if there is a need for detailed design specifications that can lower the amount of heat being dissipated. Once values are obtained for actual scenario use, finite element modeling can be created and verified using the experimental data. Preliminary work has already begun by another researcher at the University of Pittsburgh that shows promising results through improvement in a finite element model when the experimentally-determined conductivity values were used.

APPENDIX A

ALUMINUM THERMAL CONDUCTIVITY DATA

Table 5: Test Data for Aluminum

Time	Ch 0	Ch 1	Ch 2	Ch 3	Temp	Temp
	Bottom Al #1	Top #1 Al	Top #2 Al	Bottom Al #2	Diff °C #1	Diff °C #2
10:31:28	34.24	34.24	32.30	32.24	0.00	0.06
10:31:33	34.24	34.37	32.37	32.18	0.13	0.19
10:31:38	34.18	34.44	32.37	32.18	0.26	0.19
10:31:43	34.18	34.44	32.50	32.11	0.26	0.39
10:31:48	34.18	34.50	32.50	32.18	0.32	0.32
10:31:53	34.18	34.63	32.56	32.18	0.45	0.39
10:31:58	34.31	34.63	32.56	32.18	0.32	0.39
10:32:03	34.31	34.69	32.63	32.18	0.39	0.45
10:32:08	34.31	34.76	32.69	32.24	0.45	0.45
10:32:13	34.31	34.82	32.76	32.24	0.52	0.52
10:32:18	34.37	34.82	32.82	32.30	0.45	0.52
10:32:23	34.42	34.87	32.80	32.29	0.45	0.52
10:32:28	34.42	34.94	32.87	32.35	0.52	0.52
10:32:33	34.50	34.95	32.95	32.37	0.45	0.58
10:32:38	34.56	35.02	33.01	32.50	0.45	0.52
10:32:43	34.61	35.06	33.06	32.55	0.45	0.52
10:32:48	34.61	35.06	33.06	32.61	0.45	0.45
10:32:53	34.68	35.13	33.06	32.61	0.45	0.45
10:32:58	34.68	35.13	33.13	32.61	0.45	0.52
10:33:03	34.68	35.19	33.13	32.68	0.52	0.45
10:33:08	34.81	35.19	33.19	32.74	0.39	0.45
10:33:13	34.74	35.26	33.19	32.74	0.52	0.45
10:33:18	34.81	35.32	33.32	32.74	0.52	0.58
10:33:23	34.87	35.39	33.32	32.87	0.52	0.45
10:33:28	34.94	35.32	33.39	32.80	0.39	0.58
10:33:33	35.00	35.45	33.45	32.93	0.45	0.52
10:33:38	35.00	35.45	33.45	32.93	0.45	0.52
10:33:43	34.98	35.44	33.50	32.98	0.45	0.52
10:33:48	35.05	35.50	33.56	33.05	0.45	0.52
10:33:53	35.11	35.56	33.56	33.05	0.45	0.52

Table 5 (continued)

10:33:58	35.13	35.65	33.71	33.13		0.52	0.58
10:34:03	35.11	35.63	33.69	33.11		0.52	0.58
10:34:08	35.18	35.69	33.76	33.18		0.52	0.58
10:34:13	35.24	35.76	33.76	33.24		0.52	0.52
10:34:18	35.24	35.69	33.82	33.30		0.45	0.52
10:34:23	35.31	35.76	33.82	33.30		0.45	0.52
10:34:28	35.31	35.82	33.82	33.37		0.52	0.45
10:34:33	35.35	35.81	33.87	33.35		0.45	0.52
10:34:38	35.35	35.87	33.93	33.42		0.52	0.52
10:34:43	35.42	35.94	33.93	33.42		0.52	0.52
10:34:48	35.42	35.94	34.00	33.48		0.52	0.52
10:34:53	35.48	36.00	34.06	33.48		0.52	0.58
10:34:58	35.48	36.00	34.06	33.61		0.52	0.45
10:35:03	35.55	36.00	34.13	33.55		0.45	0.58
10:35:08	35.61	36.07	34.13	33.61		0.45	0.52
10:35:13	35.61	36.13	34.19	33.74		0.52	0.45
10:35:18	35.68	36.13	34.19	33.74		0.45	0.45
10:35:23	35.66	36.11	34.24	33.72		0.45	0.52
10:35:28	35.66	36.18	34.31	33.72		0.52	0.58
10:35:33	35.79	36.18	34.31	33.79		0.39	0.52
10:35:38	35.73	36.18	34.37	33.85		0.45	0.52
10:35:43	35.73	36.24	34.37	33.85		0.52	0.52
10:35:48	35.79	36.24	34.43	33.85		0.45	0.58
10:35:53	35.79	36.31	34.43	33.98		0.52	0.45
10:35:58	35.86	36.37	34.43	33.98		0.52	0.45
10:36:03	35.92	36.37	34.50	34.05		0.45	0.45
10:36:08	35.92	36.37	34.50	34.05		0.45	0.45
10:36:13	35.92	36.44	34.56	34.05		0.52	0.52
10:36:18	35.98	36.37	34.63	34.11		0.39	0.52
10:36:23	35.97	36.42	34.61	34.10		0.45	0.52
10:36:28	36.03	36.42	34.61	34.10		0.39	0.52
10:36:33	36.10	36.48	34.68	34.16		0.39	0.52
10:36:38	36.10	36.55	34.74	34.22		0.45	0.52
10:36:43	36.16	36.68	34.74	34.29		0.52	0.45
10:36:48	36.16	36.68	34.81	34.29		0.52	0.52
10:36:53	36.16	36.74	34.87	34.29		0.58	0.58
10:36:58	36.27	36.73	34.92	34.34		0.45	0.58
10:37:03	36.21	36.73	34.92	34.40		0.52	0.52
10:37:08	36.27	36.73	34.98	34.40		0.45	0.58
10:37:13	36.34	36.73	34.98	34.47		0.39	0.52
10:37:18	36.34	36.79	34.98	34.47		0.45	0.52
10:37:23	36.34	36.79	35.05	34.47		0.45	0.58
10:37:28	36.40	36.86	35.05	34.53		0.45	0.52
10:37:33	36.40	36.86	35.11	34.60		0.45	0.52
10:37:38	36.47	36.86	35.11	34.66		0.39	0.45

Table 5 (continued)

10:37:43	36.47	36.92	35.18	34.66		0.45	0.52
10:37:48	36.47	36.98	35.18	34.66		0.52	0.52
10:37:53	36.54	36.99	35.25	34.73		0.45	0.52
10:37:58	36.60	37.05	35.31	34.72		0.45	0.58
10:38:03	36.60	37.05	35.31	34.79		0.45	0.52
10:38:08	36.60	37.18	35.37	34.79		0.58	0.58
10:38:13	36.66	37.18	35.43	34.92		0.52	0.52
10:38:18	36.73	37.18	35.43	34.92		0.45	0.52
10:38:23	36.71	37.16	35.48	34.90		0.45	0.58
10:38:28	36.79	37.18	35.50	34.98		0.39	0.52
10:38:33	36.77	37.23	35.55	34.97		0.45	0.58
10:38:38	36.77	37.23	35.61	34.97		0.45	0.65
10:38:43	36.84	37.23	35.55	35.03		0.39	0.52
10:38:48	36.84	37.29	35.61	35.10		0.45	0.52
10:38:53	36.84	37.36	35.61	35.10		0.52	0.52
10:38:58	36.90	37.36	35.61	35.10		0.45	0.52
10:39:03	36.90	37.36	35.68	35.16		0.45	0.52
10:39:08	36.97	37.36	35.68	35.16		0.39	0.52
10:39:13	36.89	37.40	35.73	35.21		0.52	0.52
10:39:18	36.97	37.42	35.81	35.22		0.45	0.58
10:39:23	37.03	37.48	35.74	35.29		0.45	0.45
10:39:28	37.10	37.48	35.81	35.29		0.39	0.52
10:39:33	37.03	37.55	35.87	35.35		0.52	0.52
10:39:38	37.10	37.55	35.87	35.42		0.45	0.45
10:39:43	37.10	37.55	35.94	35.42		0.45	0.52
10:39:48	37.16	37.55	35.94	35.35		0.39	0.58
10:39:53	37.10	37.61	35.94	35.42		0.52	0.52
10:39:58	37.21	37.60	35.98	35.47		0.39	0.52
10:40:03	37.21	37.66	35.98	35.47		0.45	0.52
10:40:08	37.27	37.73	36.05	35.47		0.45	0.58
10:40:13	37.21	37.73	36.05	35.53		0.52	0.52
10:40:18	37.27	37.73	36.11	35.60		0.45	0.52
10:40:23	37.27	37.73	36.11	35.60		0.45	0.52
10:40:28	37.34	37.73	36.11	35.60		0.39	0.52
10:40:33	37.34	37.73	36.11	35.60		0.39	0.52
10:40:38	37.34	37.79	36.18	35.66		0.45	0.52
10:40:43	37.34	37.86	36.24	35.66		0.52	0.58
10:40:48	37.40	37.86	36.24	35.73		0.45	0.52
10:40:53	37.34	37.86	36.24	35.73		0.52	0.52
10:40:58	37.40	37.86	36.31	35.79		0.45	0.52
10:41:03	37.47	37.92	36.31	35.79		0.45	0.52
10:41:08	37.47	37.92	36.31	35.85		0.45	0.45
10:41:13	37.53	37.99	36.37	35.92		0.45	0.45
10:41:18	37.53	37.99	36.44	35.85		0.45	0.58
10:41:23	37.60	38.05	36.50	35.98		0.45	0.52

Table 5 (continued)

10:41:28	37.53	38.05	36.50	35.98		0.52	0.52
10:41:33	37.60	38.05	36.44	35.98		0.45	0.45
10:41:38	37.60	38.11	36.50	35.98		0.52	0.52
10:41:43	37.65	38.10	36.48	36.03		0.45	0.45
10:41:48	37.66	38.11	36.50	36.05		0.45	0.45
10:41:53	37.66	38.11	36.63	36.05		0.45	0.58
10:41:58	37.73	38.18	36.63	36.11		0.45	0.52
10:42:03	37.65	38.16	36.68	36.10		0.52	0.58
10:42:08	37.73	38.24	36.63	36.18		0.52	0.45
10:42:13	37.73	38.24	36.69	36.18		0.52	0.52
10:42:18	37.79	38.31	36.69	36.24		0.52	0.45
10:42:23	37.86	38.24	36.76	36.18		0.39	0.58
10:42:28	37.86	38.31	36.76	36.24		0.45	0.52
10:42:33	37.84	38.36	36.74	36.23		0.52	0.52
10:42:38	37.84	38.29	36.81	36.23		0.45	0.58
10:42:43	37.84	38.36	36.81	36.29		0.52	0.52
10:42:48	37.90	38.42	36.87	36.29		0.52	0.58
10:42:53	37.90	38.36	36.87	36.42		0.45	0.45
10:42:58	37.97	38.42	36.94	36.35		0.45	0.58
10:43:03	37.97	38.49	37.00	36.35		0.52	0.65
10:43:08	37.97	38.49	36.94	36.42		0.52	0.52
10:43:13	38.03	38.49	37.00	36.42		0.45	0.58
10:43:18	38.03	38.49	37.00	36.48		0.45	0.52
10:43:23	38.10	38.49	37.00	36.48		0.39	0.52
10:43:28	38.10	38.55	37.06	36.48		0.45	0.58
10:43:33	38.10	38.55	37.00	36.55		0.45	0.45
10:43:38	38.10	38.55	37.13	36.55		0.45	0.58
10:43:43	38.16	38.61	37.13	36.61		0.45	0.52
10:43:48	38.16	38.61	37.13	36.68		0.45	0.45
10:43:53	38.23	38.61	37.13	36.68		0.39	0.45
10:43:58	38.16	38.68	37.13	36.68		0.52	0.45
10:44:03	38.23	38.61	37.13	36.68		0.39	0.45
10:44:08	38.23	38.68	37.26	36.68		0.45	0.58
10:44:13	38.23	38.68	37.26	36.74		0.45	0.52
10:44:18	38.28	38.66	37.24	36.73		0.39	0.52
10:44:23	38.23	38.74	37.32	36.74		0.52	0.58
10:44:28	38.28	38.73	37.31	36.73		0.45	0.58
10:44:33	38.28	38.73	37.31	36.79		0.45	0.52
10:44:38	38.36	38.74	37.32	36.81		0.39	0.52
10:44:43	38.34	38.79	37.37	36.85		0.45	0.52
10:44:48	38.34	38.79	37.31	36.85		0.45	0.45
10:44:53	38.34	38.79	37.37	36.85		0.45	0.52
10:44:58	38.34	38.79	37.44	36.85		0.45	0.58
10:45:03	38.40	38.86	37.44	36.92		0.45	0.52
10:45:08	38.39	38.84	37.42	36.90		0.45	0.52

Table 5 (continued)

10:45:13	38.47	38.84	37.48	36.97		0.37	0.52
10:45:18	38.47	38.86	37.50	36.92		0.39	0.58
10:45:23	38.45	38.90	37.42	37.03		0.45	0.39
10:45:28	38.45	38.90	37.48	36.97		0.45	0.52
10:45:33	38.45	38.90	37.48	36.97		0.45	0.52
10:45:38	38.45	38.90	37.55	37.03		0.45	0.52
10:45:43	38.53	38.92	37.56	37.04		0.39	0.52
10:45:48	38.52	38.90	37.55	37.10		0.39	0.45
10:45:53	38.52	38.97	37.61	37.03		0.45	0.58
10:45:58	38.52	38.97	37.55	37.10		0.45	0.45
10:46:03	38.57	38.95	37.60	37.08		0.39	0.52
10:46:08	38.57	38.95	37.66	37.15		0.39	0.52
10:46:13	38.57	39.02	37.66	37.21		0.45	0.45
10:46:18	38.57	39.02	37.66	37.15		0.45	0.52
10:46:23	38.57	39.08	37.66	37.15		0.52	0.52
10:46:28	38.63	39.02	37.66	37.21		0.39	0.45
10:46:33	38.57	39.08	37.73	37.15		0.52	0.58
10:46:38	38.64	39.03	37.74	37.22		0.39	0.52
10:46:43	38.63	39.08	37.73	37.21		0.45	0.52
10:46:48	38.61	39.07	37.71	37.19		0.45	0.52
10:46:53	38.68	39.07	37.77	37.26		0.39	0.52
10:46:58	38.68	39.07	37.77	37.26		0.39	0.52
10:47:03	38.61	39.07	37.77	37.26		0.45	0.52
10:47:08	38.68	39.13	37.84	37.32		0.45	0.52
10:47:13	38.68	39.19	37.84	37.32		0.52	0.52
10:47:18	38.68	39.13	37.84	37.32		0.45	0.52
10:47:23	38.66	39.18	37.82	37.37		0.52	0.45
10:47:28	38.73	39.18	37.89	37.31		0.45	0.58
10:47:33	38.73	39.18	37.89	37.37		0.45	0.52
10:47:38	38.81	39.19	37.90	37.45		0.39	0.45
10:47:43	38.79	39.18	37.89	37.37		0.39	0.52
10:47:48	38.73	39.24	37.89	37.44		0.52	0.45
10:47:53	38.79	39.18	37.95	37.44		0.39	0.52
10:47:58	38.80	39.32	37.96	37.45		0.52	0.52
10:48:03	38.79	39.24	37.95	37.37		0.45	0.58
10:48:08	38.79	39.31	37.95	37.50		0.52	0.45
10:48:13	38.86	39.31	38.02	37.50		0.45	0.52
10:48:18	38.86	39.24	38.08	37.50		0.39	0.58
10:48:23	38.92	39.31	38.02	37.56		0.39	0.45
10:48:28	38.86	39.31	38.08	37.50		0.45	0.58
10:48:33	38.52	39.23	38.06	37.61		0.71	0.45
10:48:38	38.84	39.23	38.32	37.61		0.39	0.71
10:48:43	38.90	39.29	38.39	37.68		0.39	0.71
10:48:48	38.71	39.68	38.13	37.68		0.97	0.45
10:48:53	38.90	39.29	38.19	37.74		0.39	0.45

Table 5 (continued)

10:48:58	38.98	39.43	38.20	37.75		0.45	0.45
10:49:03	39.03	39.74	38.19	37.74		0.71	0.45
10:49:08	39.03	39.36	38.26	37.74		0.32	0.52
10:49:13	38.97	39.36	38.26	37.74		0.39	0.52
10:49:18	39.03	39.42	38.26	37.81		0.39	0.45
10:49:23	39.03	39.49	38.32	37.81		0.45	0.52
10:49:28	38.97	39.49	38.32	37.81		0.52	0.52
10:49:33	39.08	39.47	38.31	37.85		0.39	0.45
10:49:38	39.11	39.50	38.40	37.88		0.39	0.52
10:49:43	39.03	39.49	38.39	37.87		0.45	0.52
10:49:48	39.02	39.47	38.37	37.85		0.45	0.52
10:49:53	39.15	39.53	38.37	37.92		0.39	0.45
10:49:58	39.15	39.47	38.37	37.92		0.32	0.45
10:50:03	39.15	39.53	38.44	37.98		0.39	0.45
10:50:08	39.15	39.60	38.44	37.98		0.45	0.45
10:50:13	39.16	39.54	38.45	37.99		0.39	0.45
10:50:18	39.15	39.53	38.44	38.05		0.39	0.39
10:50:23	39.15	39.53	38.50	37.98		0.39	0.52
10:50:28	39.15	39.60	38.50	38.05		0.45	0.45
10:50:33	39.21	39.60	38.50	38.05		0.39	0.45
10:50:38	39.21	39.60	38.56	38.05		0.39	0.52
10:50:43	39.26	39.58	38.55	38.10		0.32	0.45
10:50:48	39.19	39.65	38.55	38.03		0.45	0.52
10:50:53	39.27	39.66	38.62	38.11		0.39	0.52
10:50:58	39.27	39.72	38.62	38.17		0.45	0.45
10:51:03	39.26	39.78	38.68	38.16		0.52	0.52
10:51:08	39.26	39.84	38.74	38.23		0.58	0.52
10:51:13	39.32	39.84	38.74	38.16		0.52	0.58
10:51:18	39.32	39.78	38.74	38.23		0.45	0.52
10:51:23	39.32	39.78	38.74	38.29		0.45	0.45
10:51:28	39.39	39.78	38.74	38.29		0.39	0.45
10:51:33	39.39	39.78	38.74	38.29		0.39	0.45
10:51:38	39.39	39.84	38.81	38.35		0.45	0.45
10:51:43	39.39	39.84	38.81	38.35		0.45	0.45
10:51:48	39.45	39.78	38.81	38.35		0.32	0.45
10:51:53	39.45	39.84	38.81	38.35		0.39	0.45
10:51:58	39.39	39.84	38.87	38.42		0.45	0.45
10:52:03	39.44	39.82	38.79	38.40		0.39	0.39
10:52:08	39.45	39.90	38.87	38.35		0.45	0.52
10:52:13	39.50	39.89	38.86	38.40		0.39	0.45
10:52:18	39.50	39.95	38.98	38.40		0.45	0.58
10:52:23	39.50	39.95	38.92	38.47		0.45	0.45
10:52:28	39.52	39.97	38.94	38.48		0.45	0.45
10:52:33	39.52	40.03	39.00	38.55		0.52	0.45
10:52:38	39.50	39.95	38.98	38.47		0.45	0.52

Table 5 (continued)

10:52:43	39.57	39.95	38.98	38.47		0.39	0.52
10:52:48	39.57	40.02	38.98	38.53		0.45	0.45
10:52:53	39.63	40.02	38.98	38.47		0.39	0.52
10:52:58	39.57	39.95	38.98	38.53		0.39	0.45
10:53:03	39.64	39.96	39.06	38.48		0.32	0.58
10:53:08	39.63	40.02	39.05	38.53		0.39	0.52
10:53:13	39.63	40.08	39.05	38.60		0.45	0.45
10:53:18	39.63	40.02	39.11	38.66		0.39	0.45
10:53:23	39.63	40.08	39.11	38.60		0.45	0.52
10:53:28	39.69	40.08	39.11	38.66		0.39	0.45
10:53:33	39.69	40.08	39.18	38.66		0.39	0.52
10:53:38	39.69	40.08	39.18	38.66		0.39	0.52
10:53:43	39.69	40.08	39.18	38.66		0.39	0.52
10:53:48	39.69	40.15	39.18	38.73		0.45	0.45
10:53:53	39.76	40.21	39.24	38.73		0.45	0.52
10:53:58	39.76	40.15	39.24	38.79		0.39	0.45
10:54:03	39.76	40.21	39.31	38.73		0.45	0.58
10:54:08	39.76	40.28	39.31	38.73		0.52	0.58
10:54:13	39.76	40.21	39.37	38.86		0.45	0.52
10:54:18	39.82	40.28	39.37	38.86		0.45	0.52
10:54:23	39.82	40.28	39.31	38.86		0.45	0.45
10:54:28	39.82	40.40	39.31	38.86		0.58	0.45
10:54:33	39.82	40.34	39.37	38.79		0.52	0.58
10:54:38	39.82	40.34	39.31	38.92		0.52	0.39
10:54:43	39.87	40.32	39.36	38.84		0.45	0.52
10:54:48	39.89	40.34	39.37	38.92		0.45	0.45

APPENDIX B

BUTTER-BOARD THERMAL CONDUCTIVITY DATA

Table 6: Test Data for Uncured and 100°C Cured Butter-Board

Time	Ch 0	Ch 1	Temp	Time	Ch 0	Ch 1	Temp
	Top BB	Bottom BB	Diff °C		Top	Bottom	Diff °C
	uncured	uncured	uncured		BB 100	BB 100	BB 100
09:51:56	23.86	25.15	1.29	08:59:54	23.69	24.72	0.37
09:52:01	23.86	25.21	1.36	08:59:59	23.70	24.73	0.37
09:52:06	23.79	25.47	1.68	09:00:04	23.70	24.73	0.38
09:52:11	23.79	26.31	2.52	09:00:09	23.63	24.72	0.38
09:52:16	23.79	27.47	3.68	09:00:14	23.57	24.80	0.38
09:52:21	23.74	28.58	4.84	09:00:19	23.56	25.11	0.38
09:52:26	23.74	29.68	5.94	09:00:24	23.57	26.09	0.38
09:52:31	23.74	30.84	7.10	09:00:29	23.57	27.25	0.38
09:52:36	23.74	31.94	8.20	09:00:34	23.50	28.34	0.38
09:52:41	23.79	33.09	9.30	09:00:39	23.51	29.58	0.38
09:52:46	23.74	34.07	10.33	09:00:44	23.50	30.73	0.38
09:52:51	23.73	35.03	11.30	09:00:49	23.50	31.83	0.38
09:52:56	23.73	36.00	12.27	09:00:54	23.50	32.86	0.38
09:53:01	23.73	36.96	13.24	09:00:59	23.51	34.04	0.38
09:53:06	23.72	37.80	14.08	09:01:04	23.50	34.99	0.38
09:53:11	23.71	38.76	15.05	09:01:09	23.50	36.03	0.38
09:53:16	23.73	39.61	15.88	09:01:14	23.50	36.86	0.38
09:53:21	23.66	40.32	16.66	09:01:19	23.43	37.90	0.38
09:53:26	23.71	41.21	17.50	09:01:24	23.44	38.81	0.38
09:53:31	23.72	41.87	18.15	09:01:29	23.43	39.64	0.38
09:53:36	23.71	42.63	18.92	09:01:34	23.51	40.56	0.38
09:53:41	23.65	43.28	19.63	09:01:39	23.43	41.26	0.38
09:53:46	23.71	44.05	20.34	09:01:44	23.44	42.11	0.38
09:53:51	23.71	44.63	20.92	09:01:49	23.38	42.88	0.38
09:53:56	23.72	45.29	21.57	09:01:54	23.50	43.58	0.38
09:54:01	23.78	45.92	22.15	09:01:59	23.52	44.30	0.38
09:54:06	23.71	46.57	22.86	09:02:04	23.43	45.00	0.38
09:54:11	23.78	47.22	23.44	09:02:09	23.50	45.71	0.38
09:54:16	23.71	47.73	24.02	09:02:14	23.43	46.36	0.38

Table 6 (continued)

09:54:21	23.71	48.31		24.60	09:02:19	23.38	47.01		0.38
09:54:26	23.71	48.89		25.18	09:02:24	23.44	47.66		0.38
09:54:31	23.69	49.39		25.70	09:02:29	23.44	48.24		0.38
09:54:36	23.66	49.86		26.21	09:02:34	23.38	48.76		0.38
09:54:41	23.69	50.43		26.73	09:02:39	23.43	49.39		0.38
09:54:46	23.70	50.83		27.12	09:02:44	23.44	49.92		0.38
09:54:51	23.69	51.40		27.70	09:02:49	23.43	50.49		0.38
09:54:56	23.76	51.85		28.09	09:02:54	23.44	51.02		0.38
09:55:01	23.69	52.30		28.61	09:02:59	23.38	51.53		0.38
09:55:06	23.70	52.75		29.05	09:03:04	23.43	51.97		0.38
09:55:11	23.64	53.19		29.55	09:03:09	23.38	52.50		0.38
09:55:16	23.69	53.62		29.93	09:03:14	23.43	52.93		0.38
09:55:21	23.69	54.00		30.30	09:03:19	23.43	53.37		0.38
09:55:26	23.69	54.43		30.75	09:03:24	23.37	53.87		0.38
09:55:31	23.68	54.74		31.06	09:03:29	23.43	54.25		0.38
09:55:36	23.68	55.18		31.50	09:03:34	23.38	54.76		0.38
09:55:41	23.68	55.55		31.88	09:03:39	23.44	55.20		0.38
09:55:46	23.69	55.94		32.25	09:03:44	23.44	55.58		0.38
09:55:51	23.68	56.25		32.57	09:03:49	23.44	55.89		0.38
09:55:56	23.68	56.62		32.94	09:03:54	23.38	56.33		0.38
09:56:01	23.68	57.00		33.32	09:03:59	23.44	56.65		0.38
09:56:06	23.61	57.31		33.70	09:04:04	23.38	57.02		0.38
09:56:11	23.68	57.69		34.01	09:04:09	23.43	57.39		0.38
09:56:16	23.66	57.93		34.26	09:04:14	23.44	57.71		0.38
09:56:21	23.67	58.31		34.64	09:04:19	23.44	58.09		0.38
09:56:26	23.74	58.63		34.89	09:04:24	23.37	58.46		0.38
09:56:31	23.73	58.87		35.14	09:04:29	23.43	58.77		0.38
09:56:36	23.67	59.26		35.58	09:04:34	23.43	59.09		0.38
09:56:41	23.66	59.50		35.83	09:04:39	23.44	59.47		0.38
09:56:46	23.66	59.81		36.15	09:04:44	23.44	59.73		0.38
09:56:51	23.66	60.06		36.40	09:04:49	23.37	60.03		0.38
09:56:56	23.66	60.38		36.71	09:04:54	23.45	60.30		0.38
09:57:01	23.67	60.70		37.03	09:04:59	23.38	60.67		0.38
09:57:06	23.65	60.93		37.28	09:05:04	23.38	60.98		0.38
09:57:11	23.67	61.20		37.53	09:05:09	23.38	61.30		0.38
09:57:16	23.66	61.50		37.85	09:05:14	23.38	61.55		0.38
09:57:21	23.65	61.68		38.03	09:05:19	23.44	61.80		0.38
09:57:26	23.65	61.93		38.29	09:05:24	23.38	62.05		0.38
09:57:31	23.71	62.25		38.54	09:05:29	23.44	62.36		0.38
09:57:36	23.71	62.50		38.79	09:05:34	23.44	62.68		0.38
09:57:41	23.71	62.75		39.04	09:05:39	23.50	62.92		0.38
09:57:46	23.71	62.94		39.23	09:05:44	23.43	63.17		0.38
09:57:51	23.72	63.20		39.48	09:05:49	23.37	63.42		0.38
09:57:56	23.72	63.45		39.73	09:05:54	23.44	63.68		0.38
09:58:01	23.65	63.69		40.05	09:05:59	23.44	63.87		0.38

Table 6 (continued)

09:58:06	23.65	63.88	40.23	09:06:04	23.44	64.19	0.38
09:58:11	23.71	64.13	40.42	09:06:09	23.44	64.44	0.38
09:58:16	23.69	64.37	40.67	09:06:14	23.43	64.62	0.38
09:58:21	23.69	64.56	40.86	09:06:19	23.51	64.88	0.38
09:58:26	23.69	64.81	41.11	09:06:24	23.44	65.13	0.38
09:58:31	23.70	65.07	41.36	09:06:29	23.51	65.32	0.38
09:58:36	23.70	65.26	41.55	09:06:34	23.51	65.57	0.38
09:58:41	23.70	65.45	41.74	09:06:39	23.51	65.76	0.38
09:58:46	23.77	65.63	41.87	09:06:44	23.44	65.95	0.38
09:58:51	23.69	65.81	42.12	09:06:49	23.50	66.19	0.38
09:58:56	23.69	66.06	42.37	09:06:54	23.51	66.39	0.38
09:59:01	23.76	66.25	42.49	09:06:59	23.51	66.57	0.38
09:59:06	23.76	66.44	42.68	09:07:04	23.48	66.80	0.38
09:59:11	23.70	66.64	42.94	09:07:09	23.56	67.00	0.38
09:59:16	23.77	66.83	43.06	09:07:14	23.50	67.25	0.38
09:59:21	23.76	67.01	43.25	09:07:19	23.56	67.38	0.38
09:59:26	23.68	67.18	43.50	09:07:24	23.50	67.63	0.38
09:59:31	23.82	67.38	43.56	09:07:29	23.57	67.83	0.38
09:59:36	23.82	67.57	43.75	09:07:34	23.57	67.96	0.38
09:59:41	23.75	67.75	44.00	09:07:39	23.57	68.21	0.38
09:59:46	23.81	67.87	44.06	09:07:44	23.51	68.40	0.38
09:59:51	23.81	68.12	44.31	09:07:49	23.56	68.51	0.38
09:59:56	23.74	68.25	44.50	09:07:54	23.57	68.71	0.38
10:00:01	23.81	68.43	44.63	09:07:59	23.56	68.95	0.38
10:00:06	23.74	68.62	44.88	09:08:04	23.56	69.08	0.38
10:00:11	23.81	68.75	44.94	09:08:09	23.64	69.21	0.38
10:00:16	23.82	68.95	45.13	09:08:14	23.64	69.40	0.38
10:00:21	23.82	69.07	45.26	09:08:19	23.64	69.59	0.38
10:00:26	23.82	69.20	45.38	09:08:24	23.64	69.78	0.38
10:00:31	23.81	69.38	45.57	09:08:29	23.64	69.97	0.38
10:00:36	23.82	69.58	45.76	09:08:34	23.70	70.09	0.38
10:00:41	23.88	69.77	45.88	09:08:39	23.70	70.22	0.38
10:00:46	23.82	69.89	46.07	09:08:44	23.70	70.41	0.38
10:00:51	23.82	70.02	46.20	09:08:49	23.70	70.53	0.38
10:00:56	23.81	70.19	46.39	09:08:54	23.70	70.72	0.38
10:01:01	23.87	70.38	46.51	09:08:59	23.70	70.91	0.38
10:01:06	23.86	70.44	46.58	09:09:04	23.77	71.04	0.38
10:01:11	23.86	70.57	46.70	09:09:09	23.69	71.15	0.38
10:01:16	23.86	70.68	46.83	09:09:14	23.70	71.35	0.38
10:01:21	23.86	70.87	47.01	09:09:19	23.77	71.41	0.38
10:01:26	23.93	71.01	47.08	09:09:24	23.82	71.59	0.38
10:01:31	23.92	71.12	47.20	09:09:29	23.83	71.79	0.38
10:01:36	23.92	71.25	47.33	09:09:34	23.77	71.92	0.38
10:01:41	23.93	71.45	47.52	09:09:39	23.83	72.04	0.38
10:01:46	23.93	71.57	47.64	09:09:44	23.82	72.16	0.38

Table 6 (continued)

10:01:51	23.93	71.70	47.77	09:09:49	23.82	72.28	0.38
10:01:56	23.92	71.81	47.89	09:09:54	23.83	72.48	0.38
10:02:01	23.98	71.94	47.95	09:09:59	23.83	72.61	0.38
10:02:06	23.99	72.07	48.08	09:10:04	23.83	72.73	0.38
10:02:11	23.98	72.19	48.20	09:10:09	23.90	72.80	0.38
10:02:16	23.99	72.33	48.33	09:10:14	23.96	72.98	0.38
10:02:21	23.98	72.44	48.46	09:10:19	23.90	73.11	0.38
10:02:26	23.99	72.58	48.58	09:10:24	23.90	73.18	0.38
10:02:31	24.11	72.69	48.58	09:10:29	23.95	73.29	0.38
10:02:36	24.03	72.80	48.77	09:10:34	23.95	73.48	0.38
10:02:41	24.03	72.93	48.89	09:10:39	23.98	73.57	0.38
10:02:46	24.04	73.00	48.96	09:10:44	24.03	73.68	0.38
10:02:51	24.04	73.19	49.15	09:10:49	23.97	73.81	0.38
10:02:56	24.11	73.32	49.21	09:10:54	24.03	73.93	0.38
10:03:01	24.10	73.37	49.27	09:10:59	24.02	74.05	0.38
10:03:06	24.10	73.56	49.46	09:11:04	24.10	74.25	0.38
10:03:11	24.17	73.63	49.46	09:11:09	24.11	74.32	0.38
10:03:16	24.11	73.76	49.65	09:11:14	24.17	74.45	0.38
10:03:21	24.11	73.88	49.77	09:11:19	24.11	74.56	0.38
10:03:26	24.16	73.93	49.77	09:11:24	24.19	74.65	0.38
10:03:31	24.17	74.07	49.90	09:11:29	24.24	74.76	0.38
10:03:36	24.16	74.18	50.02	09:11:34	24.19	74.90	0.38
10:03:41	24.17	74.32	50.15	09:11:39	24.24	74.95	0.38
10:03:46	24.16	74.37	50.21	09:11:44	24.24	75.14	0.38
10:03:51	24.29	74.50	50.21	09:11:49	24.31	75.20	0.38
10:03:56	24.23	74.62	50.40	09:11:54	24.33	75.36	0.38
10:04:01	24.27	74.73	50.46	09:11:59	24.32	75.47	0.38
10:04:06	24.35	74.81	50.46	09:12:04	24.32	75.60	0.38
10:04:11	24.34	74.92	50.58	09:12:09	24.33	75.73	0.38
10:04:16	24.35	75.00	50.65	09:12:14	24.40	75.86	0.38
10:04:21	24.40	75.11	50.71	09:12:19	24.40	75.92	0.38
10:04:26	24.40	75.24	50.83	09:12:24	24.39	75.97	0.38
10:04:31	24.41	75.37	50.96	09:12:29	24.40	76.12	0.38
10:04:36	24.40	75.49	51.08	09:12:34	24.48	76.19	0.38
10:04:41	24.34	75.49	51.15	09:12:39	24.48	76.32	0.38
10:04:46	24.41	75.62	51.21	09:12:44	24.61	76.44	0.38
10:04:51	24.40	75.74	51.34	09:12:49	24.53	76.49	0.38
10:04:56	24.47	75.80	51.33	09:12:54	24.54	76.63	0.38
10:05:01	24.39	75.86	51.48	09:12:59	24.61	76.69	0.38
10:05:06	24.45	75.97	51.52	09:13:04	24.61	76.75	0.38
10:05:11	24.47	76.12	51.65	09:13:09	24.61	76.89	0.38
10:05:16	24.45	76.16	51.71	09:13:14	24.69	77.02	0.38
10:05:21	24.52	76.23	51.71	09:13:19	24.67	77.07	0.38
10:05:26	24.59	76.36	51.77	09:13:24	24.62	77.15	0.38
10:05:31	24.59	76.49	51.90	09:13:29	24.68	77.26	0.38

Table 6 (continued)

10:05:36	24.53	76.49		51.96	09:13:34	24.74	77.33		0.38
10:05:41	24.58	76.60		52.02	09:13:39	24.81	77.45		0.38
10:05:46	24.58	76.73		52.15	09:13:44	24.74	77.58		0.38
10:05:51	24.66	76.80		52.15	09:13:49	24.82	77.65		0.38
10:05:56	24.65	76.85		52.21	09:13:54	24.88	77.71		0.38
10:06:01	24.72	76.99		52.27	09:13:59	24.82	77.84		0.38
10:06:06	24.66	77.12		52.46	09:14:04	24.95	77.90		0.38
10:06:11	24.69	77.09		52.40	09:14:09	24.95	77.96		0.38
10:06:16	24.76	77.22		52.46	09:14:14	24.94	78.02		0.38
10:06:21	24.70	77.29		52.59	09:14:19	24.94	78.14		0.38
10:06:26	24.77	77.35		52.58	09:14:24	24.95	78.28		0.39
10:06:31	24.82	77.47		52.64	09:14:29	25.03	78.36		0.39
10:06:36	24.77	77.60		52.84	09:14:34	25.03	78.42		0.39
10:06:41	24.82	77.66		52.83	09:14:39	25.16	78.48		0.39
10:06:46	24.77	77.73		52.96	09:14:44	25.09	78.61		0.39
10:06:51	24.82	77.84		53.02	09:14:49	25.16	78.67		0.39
10:06:56	24.87	77.83		52.96	09:14:54	25.15	78.72		0.39
10:07:01	24.95	77.96		53.02	09:14:59	25.22	78.86		0.39
10:07:06	24.96	78.04		53.08	09:15:04	25.28	78.86		0.39
10:07:11	24.95	78.09		53.14	09:15:09	25.24	79.00		0.39
10:07:16	25.01	78.22		53.21	09:15:14	25.24	79.00		0.39
10:07:21	25.01	78.22		53.21	09:15:19	25.29	79.12		0.39
10:07:26	24.94	78.27		53.33	09:15:24	25.36	79.18		0.39
10:07:31	24.94	78.39		53.46	09:15:29	25.37	79.25		0.39
10:07:36	24.98	78.44		53.46	09:15:34	25.37	79.38		0.39
10:07:41	24.99	78.51		53.52	09:15:39	25.42	79.49		0.39
10:07:46	24.99	78.58		53.58	09:15:44	25.43	79.50		0.39
10:07:51	25.11	78.69		53.58	09:15:49	25.36	79.62		0.39
10:07:56	25.05	78.75		53.71	09:15:54	25.42	79.62		0.39
10:08:01	25.03	78.80		53.77	09:15:59	25.48	79.74		0.39
10:08:06	25.10	78.86		53.77	09:16:04	25.48	79.81		0.39
10:08:11	25.10	78.93		53.83	09:16:09	25.56	79.88		0.39
10:08:16	25.17	79.00		53.83	09:16:14	25.56	79.94		0.39
10:08:21	25.16	79.12		53.95	09:16:19	25.56	80.01		0.39
10:08:26	25.17	79.13		53.96	09:16:24	25.62	80.07		0.39
10:08:31	25.23	79.24		54.02	09:16:29	25.55	80.18		0.39
10:08:36	25.24	79.25		54.02	09:16:34	25.61	80.25		0.39
10:08:41	25.30	79.38		54.08	09:16:39	25.70	80.33		0.39
10:08:46	25.35	79.43		54.08	09:16:44	25.70	80.39		0.39
10:08:51	25.35	79.49		54.14	09:16:49	25.77	80.46		0.39
10:08:56	25.34	79.54		54.20	09:16:54	25.76	80.51		0.39
10:09:01	25.34	79.60		54.26	09:16:59	25.82	80.58		0.39
10:09:06	25.35	79.74		54.39	09:17:04	25.76	80.64		0.39
10:09:11	25.40	79.79		54.39	09:17:09	25.83	80.71		0.39
10:09:16	25.53	79.85		54.32	09:17:14	25.83	80.78		0.39

Table 6 (continued)

10:09:21	25.52	79.84		54.32	09:17:19	25.89	80.89		0.39
10:09:26	25.52	79.96		54.45	09:17:24	25.90	80.90		0.39
10:09:31	25.58	80.03		54.45	09:17:29	25.95	80.95		0.39
10:09:36	25.59	80.04		54.45	09:17:34	26.02	81.02		0.39
10:09:41	25.58	80.15		54.57	09:17:39	25.95	81.14		0.39
10:09:46	25.56	80.20		54.63	09:17:44	26.03	81.15		0.39
10:09:51	25.56	80.26		54.70	09:17:49	26.08	81.21		0.39
10:09:56	25.58	80.34		54.76	09:17:54	26.09	81.28		0.39
10:10:01	25.56	80.39		54.82	09:17:59	26.16	81.34		0.39
10:10:06	25.69	80.45		54.76	09:18:04	26.16	81.41		0.39
10:10:11	25.63	80.51		54.88	09:18:09	26.24	81.48		0.39
10:10:16	25.77	80.59		54.82	09:18:14	26.21	81.52		0.39
10:10:21	25.63	80.64		55.01	09:18:19	26.21	81.65		0.39
10:10:26	25.69	80.70		55.01	09:18:24	26.30	81.74		0.39
10:10:31	25.70	80.71		55.01	09:18:29	26.29	81.72		0.39
10:10:36	25.82	80.76		54.94	09:18:34	26.37	81.80		0.39
10:10:41	25.83	80.84		55.01	09:18:39	26.37	81.86		0.39
10:10:46	25.83	80.96		55.13	09:18:44	26.37	81.92		0.39
10:10:51	25.83	80.96		55.13	09:18:49	26.36	81.98		0.39
10:10:56	25.82	81.02		55.19	09:18:54	26.42	81.98		0.39
10:11:01	25.90	81.09		55.19	09:18:59	26.50	82.05		0.39
10:11:06	25.90	81.15		55.26	09:19:04	26.55	82.10		0.39
10:11:11	25.87	81.19		55.32	09:19:09	26.55	82.23		0.39
10:11:16	25.89	81.27		55.38	09:19:14	26.56	82.30		0.39
10:11:21	25.95	81.33		55.38	09:19:19	26.56	82.30		0.39
10:11:26	25.95	81.33		55.38	09:19:24	26.55	82.35		0.39
10:11:31	26.02	81.46		55.44	09:19:29	26.63	82.43		0.39
10:11:36	26.03	81.53		55.50	09:19:34	26.63	82.49		0.39
10:11:41	26.09	81.53		55.44	09:19:39	26.70	82.56		0.39
10:11:46	26.16	81.53		55.37	09:19:44	26.71	82.63		0.39
10:11:51	26.08	81.58		55.50	09:19:49	26.70	82.68		0.39
10:11:56	26.09	81.72		55.63	09:19:54	26.77	82.69		0.39
10:12:01	26.21	81.77		55.56	09:19:59	26.83	82.81		0.39
10:12:06	26.28	81.78		55.50	09:20:04	26.83	82.81		0.39
10:12:11	26.21	81.83		55.62	09:20:09	26.89	82.87		0.39
10:12:16	26.34	81.90		55.56	09:20:14	26.89	82.87		0.39
10:12:21	26.27	81.96		55.68	09:20:19	26.89	83.00		0.39
10:12:26	26.34	82.02		55.68	09:20:24	26.89	83.06		0.39
10:12:31	26.34	82.08		55.74	09:20:29	27.02	83.12		0.39
10:12:36	26.32	82.13		55.81	09:20:34	26.95	83.19		0.39
10:12:41	26.27	82.14		55.87	09:20:39	27.03	83.20		0.39
10:12:46	26.40	82.21		55.81	09:20:44	27.02	83.25		0.39
10:12:51	26.40	82.27		55.87	09:20:49	27.02	83.31		0.39
10:12:56	26.47	82.27		55.80	09:20:54	27.09	83.32		0.39
10:13:01	26.53	82.40		55.87	09:20:59	27.02	83.37		0.39

Table 6 (continued)

10:13:06	26.54	82.47		55.93	09:21:04	27.15	83.44		0.39
10:13:11	26.53	82.46		55.93	09:21:09	27.17	83.53		0.39
10:13:16	26.61	82.47		55.87	09:21:14	27.23	83.58		0.39
10:13:21	26.67	82.60		55.93	09:21:19	27.28	83.56		0.39
10:13:26	26.60	82.59		55.99	09:21:24	27.21	83.63		0.39
10:13:31	26.60	82.65		56.05	09:21:29	27.28	83.69		0.39
10:13:36	26.60	82.71		56.11	09:21:34	27.28	83.69		0.39
10:13:41	26.67	82.79		56.11	09:21:39	27.34	83.75		0.39
10:13:46	26.74	82.79		56.05	09:21:44	27.36	83.89		0.39
10:13:51	26.74	82.85		56.11	09:21:49	27.36	83.89		0.39
10:13:56	26.72	82.90		56.18	09:21:54	27.42	83.96		0.39
10:14:01	26.71	82.88		56.17	09:21:59	27.50	83.97		0.39
10:14:06	26.78	82.96		56.17	09:22:04	27.42	84.02		0.39
10:14:11	26.80	83.10		56.30	09:22:09	27.50	84.03		0.39
10:14:16	26.72	83.08		56.36	09:22:14	27.50	84.09		0.39
10:14:21	26.72	83.08		56.36	09:22:19	27.56	84.16		0.39
10:14:26	26.80	83.16		56.36	09:22:24	27.55	84.21		0.39
10:14:31	26.85	83.15		56.30	09:22:29	27.68	84.27		0.39
10:14:36	26.85	83.21		56.36	09:22:34	27.62	84.27		0.39
10:14:41	26.98	83.34		56.36	09:22:39	27.68	84.33		0.39
10:14:46	26.84	83.32		56.49	09:22:44	27.68	84.40		0.39
10:14:51	26.90	83.39		56.48	09:22:49	27.77	84.49		0.39
10:14:56	26.90	83.39		56.48	09:22:54	27.83	84.41		0.39
10:15:01	26.98	83.46		56.48	09:22:59	27.76	84.54		0.39
10:15:06	26.97	83.45		56.48	09:23:04	27.82	84.53		0.39
10:15:11	26.95	83.56		56.61	09:23:09	27.82	84.60		0.39
10:15:16	26.96	83.57		56.61	09:23:14	27.84	84.61		0.39
10:15:21	27.03	83.63		56.61	09:23:19	27.90	84.67		0.39
10:15:26	27.03	83.70		56.67	09:23:24	27.89	84.73		0.39
10:15:31	27.02	83.69		56.67	09:23:29	27.90	84.80		0.39
10:15:36	27.16	83.76		56.60	09:23:34	27.97	84.86		0.39
10:15:41	27.16	83.76		56.60	09:23:39	28.02	84.85		0.39
10:15:46	27.16	83.82		56.67	09:23:44	28.08	84.85		0.39
10:15:51	27.21	83.87		56.66	09:23:49	27.96	84.98		0.39
10:15:56	27.21	83.87		56.66	09:23:54	28.03	84.99		0.39
10:16:01	27.15	83.94		56.79	09:23:59	28.03	84.99		0.39
10:16:06	27.15	84.00		56.85	09:24:04	28.09	85.05		0.39
10:16:11	27.19	83.98		56.79	09:24:09	28.09	85.05		0.39
10:16:16	27.29	84.07		56.79	09:24:14	28.09	85.18		0.39
10:16:21	27.29	84.07		56.79	09:24:19	28.09	85.18		0.39
10:16:26	27.27	84.12		56.85	09:24:24	28.16	85.24		0.39
10:16:31	27.27	84.12		56.85	09:24:29	28.24	85.32		0.39
10:16:36	27.20	84.18		56.98	09:24:34	28.17	85.37		0.39
10:16:41	27.26	84.24		56.98	09:24:39	28.23	85.37		0.39
10:16:46	27.27	84.25		56.98	09:24:44	28.30	85.38		0.39

Table 6 (continued)

10:16:51	27.27	84.25		56.98	09:24:49	28.29	85.43		0.39
10:16:56	27.33	84.31		56.98	09:24:54	28.29	85.50		0.39
10:17:01	27.33	84.37		57.04	09:24:59	28.36	85.50		0.39
10:17:06	27.46	84.44		56.97	09:25:04	28.37	85.57		0.39
10:17:11	27.45	84.49		57.03	09:25:09	28.36	85.56		0.39
10:17:16	27.45	84.49		57.03	09:25:14	28.49	85.62		0.39
10:17:21	27.45	84.49		57.03	09:25:19	28.43	85.63		0.39
10:17:26	27.45	84.55		57.10	09:25:24	28.49	85.68		0.39
10:17:31	27.46	84.62		57.16	09:25:29	28.55	85.75		0.39
10:17:36	27.51	84.67		57.16	09:25:34	28.56	85.82		0.39
10:17:41	27.51	84.67		57.16	09:25:39	28.64	85.84		0.39
10:17:46	27.58	84.73		57.16	09:25:44	28.63	85.82		0.39
10:17:51	27.50	84.72		57.22	09:25:49	28.68	85.87		0.39
10:17:56	27.57	84.79		57.22	09:25:54	28.68	85.87		0.39
10:18:01	27.64	84.80		57.16	09:25:59	28.75	86.00		0.39
10:18:06	27.63	84.85		57.22	09:26:04	28.75	86.00		0.39
10:18:11	27.63	84.91		57.28	09:26:09	28.68	86.06		0.39
10:18:16	27.57	84.91		57.35	09:26:14	28.70	86.08		0.39
10:18:21	27.64	84.99		57.35	09:26:19	28.76	86.08		0.39
10:18:26	27.58	84.99		57.41	09:26:24	28.77	86.21		0.39
10:18:31	27.69	84.97		57.28	09:26:29	28.76	86.14		0.39
10:18:36	27.77	85.05		57.28	09:26:34	28.84	86.28		0.39
10:18:41	27.76	85.04		57.28	09:26:39	28.89	86.27		0.39
10:18:46	27.77	85.05		57.28	09:26:44	28.84	86.28		0.39
10:18:51	27.76	85.16		57.40	09:26:49	28.96	86.27		0.39
10:18:56	27.82	85.16		57.34	09:26:54	28.97	86.40		0.39
10:19:01	27.89	85.16		57.27	09:26:59	29.02	86.39		0.39
10:19:06	27.88	85.22		57.34	09:27:04	29.02	86.45		0.39
10:19:11	27.95	85.22		57.27	09:27:09	29.02	86.45		0.39
10:19:16	27.94	85.27		57.34	09:27:14	29.09	86.45		0.39
10:19:21	27.94	85.27		57.34	09:27:19	29.02	86.52		0.39
10:19:26	27.95	85.35		57.40	09:27:24	29.09	86.58		0.39
10:19:31	28.01	85.41		57.40	09:27:29	29.09	86.58		0.39
10:19:36	27.95	85.41		57.46	09:27:34	29.15	86.58		0.39
10:19:41	28.01	85.47		57.46	09:27:39	29.23	86.65		0.39
10:19:46	27.95	85.47		57.53	09:27:44	29.23	86.72		0.39
10:19:51	28.00	85.52		57.52	09:27:49	29.31	86.73		0.39
10:19:56	28.08	85.53		57.46	09:27:54	29.23	86.78		0.39
10:20:01	28.07	85.59		57.52	09:27:59	29.31	86.80		0.39
10:20:06	28.07	85.59		57.52	09:28:04	29.28	86.83		0.39
10:20:11	28.14	85.60		57.46	09:28:09	29.34	86.83		0.39
10:20:16	28.08	85.66		57.59	09:28:14	29.31	86.86		0.39
10:20:21	28.14	85.72		57.58	09:28:19	29.34	86.89		0.39
10:20:26	28.19	85.71		57.52	09:28:24	29.42	86.97		0.39
10:20:31	28.20	85.79		57.58	09:28:29	29.41	86.96		0.39

Table 6 (continued)

10:20:36	28.14	85.79		57.65	09:28:34	29.41	87.02		0.39
10:20:41	28.26	85.84		57.58	09:28:39	29.43	87.04		0.39
10:20:46	28.26	85.84		57.58	09:28:44	29.48	87.09		0.39
10:20:51	28.26	85.90		57.64	09:28:49	29.49	87.10		0.40
10:20:56	28.33	85.97		57.64	09:28:54	29.50	87.17		0.40
10:21:01	28.20	85.91		57.71	09:28:59	29.49	87.16		0.40
10:21:06	28.40	85.97		57.58	09:29:04	29.56	87.24		0.40
10:21:11	28.32	86.02		57.70	09:29:09	29.56	87.24		0.40
10:21:16	28.38	86.02		57.64	09:29:14	29.56	87.30		0.40
10:21:21	28.32	86.02		57.70	09:29:19	29.55	87.29		0.40
10:21:26	28.25	86.08		57.83	09:29:24	29.55	87.35		0.40
10:21:31	28.40	86.10		57.70	09:29:29	29.62	87.41		0.40
10:21:36	28.38	86.15		57.77	09:29:34	29.69	87.42		0.40
10:21:41	28.44	86.14		57.70	09:29:39	29.63	87.49		0.40
10:21:46	28.44	86.20		57.76	09:29:44	29.68	87.54		0.40
10:21:51	28.51	86.21		57.70	09:29:49	29.69	87.55		0.40
10:21:56	28.45	86.27		57.83	09:29:54	29.80	87.52		0.40
10:22:01	28.45	86.27		57.83	09:29:59	29.76	87.61		0.40
10:22:06	28.50	86.26		57.76	09:30:04	29.82	87.61		0.40
10:22:11	28.51	86.34		57.82	09:30:09	29.89	87.61		0.40
10:22:16	28.45	86.40		57.95	09:30:14	29.88	87.60		0.40
10:22:21	28.51	86.40		57.89	09:30:19	29.88	87.66		0.40
10:22:26	28.57	86.39		57.82	09:30:24	29.95	87.74		0.40
10:22:31	28.58	86.46		57.89	09:30:29	29.95	87.80		0.40
10:22:36	28.58	86.52		57.95	09:30:34	29.95	87.80		0.40
10:22:41	28.51	86.52		58.01	09:30:39	29.89	87.86		0.40
10:22:46	28.57	86.51		57.95	09:30:44	30.01	87.80		0.40
10:22:51	28.50	86.58		58.07	09:30:49	30.02	87.86		0.40
10:22:56	28.64	86.59		57.95	09:30:54	30.07	87.85		0.40
10:23:01	28.58	86.65		58.07	09:30:59	30.02	87.93		0.40
10:23:06	28.64	86.71		58.07	09:31:04	30.15	87.93		0.40
10:23:11	28.63	86.64		58.01	09:31:09	30.07	87.98		0.40
10:23:16	28.64	86.71		58.07	09:31:14	30.07	87.98		0.40
10:23:21	28.64	86.71		58.07	09:31:19	30.15	88.05		0.40
10:23:26	28.76	86.76		58.00	09:31:24	30.15	88.05		0.40
10:23:31	28.77	86.84		58.07	09:31:29	30.07	88.04		0.40
10:23:36	28.76	86.83		58.07	09:31:34	30.14	88.10		0.40
10:23:41	28.82	86.83		58.00	09:31:39	30.20	88.10		0.40
10:23:46	28.83	86.84		58.00	09:31:44	30.26	88.17		0.40
10:23:51	28.82	86.89		58.07	09:31:49	30.26	88.17		0.40
10:23:56	28.83	86.90		58.07	09:31:54	30.20	88.17		0.40
10:24:01	28.83	86.96		58.13	09:31:59	30.27	88.24		0.40
10:24:06	28.83	87.03		58.19	09:32:04	30.26	88.29		0.40
10:24:11	28.83	87.03		58.19	09:32:09	30.26	88.29		0.40
10:24:16	28.83	87.03		58.19	09:32:14	30.26	88.29		0.40

Table 6 (continued)

10:24:21	28.95	87.08		58.13	09:32:19	30.33	88.35		0.40
10:24:26	28.89	87.08		58.19	09:32:24	30.46	88.35		0.40
10:24:31	28.89	87.08		58.19	09:32:29	30.39	88.42		0.40
10:24:36	28.95	87.08		58.13	09:32:34	30.47	88.43		0.40
10:24:41	28.95	87.08		58.13	09:32:39	30.39	88.42		0.40
10:24:46	28.96	87.15		58.19	09:32:44	30.47	88.49		0.40
10:24:51	29.03	87.22		58.19	09:32:49	30.47	88.49		0.40
10:24:56	29.08	87.20		58.12	09:32:54	30.52	88.54		0.40
10:25:01	29.02	87.27		58.25	09:32:59	30.52	88.54		0.40
10:25:06	29.09	87.28		58.19	09:33:04	30.59	88.61		0.40
10:25:11	29.02	87.27		58.25	09:33:09	30.52	88.61		0.40
10:25:16	29.03	87.34		58.31	09:33:14	30.52	88.61		0.40
10:25:21	29.16	87.34		58.18	09:33:19	30.52	88.61		0.40
10:25:26	29.16	87.34		58.18	09:33:24	30.59	88.61		0.40
10:25:31	29.09	87.40		58.31	09:33:29	30.59	88.67		0.40
10:25:36	29.16	87.47		58.31	09:33:34	30.59	88.67		0.40
10:25:41	29.22	87.47		58.25	09:33:39	30.59	88.73		0.40
10:25:46	29.21	87.46		58.24					
10:25:51	29.22	87.47		58.25					

Table 7: Test Data for 150°C and 200°C Cured Butter-Board

Time	Ch 0	Ch 1	Temp	Time	Ch 0	Ch 1	Temp
	Top	Bottom	Diff °C		Top	Bottom	Diff °C
	BB 150	BB 150	BB 150		BB 200	BB 200	BB 200
08:05:36	22.96	22.83	-0.13	10:22:56	21.83	29.58	7.75
08:05:42	23.03	22.83	-0.19	10:23:02	21.89	29.58	7.68
08:05:46	23.03	22.83	-0.19	10:23:06	21.83	30.48	8.65
08:05:51	22.96	23.03	0.06	10:23:11	21.89	31.58	9.69
08:05:56	22.96	23.48	0.52	10:23:16	21.96	32.55	10.59
08:06:01	23.01	24.11	1.10	10:23:21	21.96	33.64	11.69
08:06:06	22.94	24.87	1.94	10:23:26	21.96	34.61	12.66
08:06:11	23.01	25.66	2.65	10:23:31	21.96	35.58	13.63
08:06:16	22.95	26.56	3.62	10:23:36	21.96	36.49	14.53
08:06:21	22.93	27.39	4.46	10:23:41	21.94	37.37	15.43
08:06:26	22.95	28.24	5.29	10:23:46	21.94	38.28	16.34
08:06:31	23.00	29.07	6.07	10:23:51	21.94	39.12	17.18
08:06:36	22.93	29.90	6.97	10:23:56	22.00	39.89	17.89
08:06:41	22.86	30.68	7.81	10:24:01	21.94	40.60	18.66
08:06:46	22.86	31.52	8.65	10:24:06	22.00	41.44	19.44
08:06:51	22.86	32.29	9.43	10:24:11	22.00	42.15	20.15
08:06:56	22.93	33.07	10.14	10:24:16	22.00	42.93	20.92
08:07:01	22.91	33.83	10.91	10:24:21	22.00	43.70	21.70
08:07:06	22.85	34.54	11.69	10:24:26	22.07	44.35	22.28
08:07:11	22.91	35.31	12.40	10:24:31	22.07	45.06	22.99
08:07:16	22.91	35.96	13.04	10:24:36	22.07	45.64	23.57
08:07:21	22.91	36.67	13.75	10:24:41	22.06	46.34	24.28
08:07:26	22.90	37.30	14.40	10:24:46	22.07	46.93	24.86
08:07:31	22.91	37.96	15.05	10:24:51	22.13	47.51	25.38
08:07:36	22.85	38.60	15.76	10:24:56	22.13	48.09	25.96
08:07:41	22.90	39.17	16.27	10:25:01	22.13	48.74	26.60
08:07:46	22.90	39.69	16.79	10:25:06	22.19	49.18	26.99
08:07:51	22.90	40.27	17.37	10:25:11	22.20	49.84	27.64
08:07:56	22.90	40.85	17.95	10:25:16	22.13	50.35	28.22
08:08:01	22.90	41.43	18.53	10:25:21	22.13	50.80	28.67
08:08:06	22.82	41.93	19.11	10:25:26	22.20	51.32	29.12
08:08:11	22.88	42.51	19.63	10:25:31	22.26	51.77	29.51
08:08:16	22.82	42.96	20.15	10:25:36	22.20	52.23	30.03
08:08:21	22.82	43.48	20.66	10:25:41	22.26	52.73	30.47
08:08:26	22.88	44.06	21.18	10:25:46	22.25	53.22	30.97
08:08:31	22.82	44.45	21.63	10:25:51	22.26	53.61	31.35
08:08:36	22.80	44.95	22.15	10:25:56	22.31	54.04	31.73
08:08:41	22.88	45.42	22.54	10:26:01	22.31	54.41	32.10
08:08:46	22.86	45.85	22.99	10:26:06	22.33	54.81	32.48
08:08:51	22.86	46.30	23.44	10:26:11	22.31	55.29	32.98
08:08:56	22.86	46.76	23.89	10:26:16	22.31	55.61	33.30
08:09:01	22.78	47.19	24.41	10:26:21	22.31	56.05	33.74

Table 7 (continued)

08:09:06	22.78	47.58	24.80	10:26:26	22.38	56.36	33.99
08:09:11	22.78	48.03	25.25	10:26:31	22.38	56.74	34.36
08:09:16	22.78	48.42	25.64	10:26:36	22.38	57.12	34.74
08:09:21	22.85	48.81	25.96	10:26:41	22.38	57.49	35.12
08:09:26	22.78	49.19	26.41	10:26:46	22.38	57.81	35.43
08:09:31	22.77	49.63	26.86	10:26:51	22.38	58.12	35.75
08:09:36	22.83	49.95	27.12	10:26:56	22.38	58.50	36.12
08:09:41	22.77	50.27	27.51	10:27:01	22.38	58.88	36.50
08:09:46	22.77	50.73	27.96	10:27:06	22.51	59.19	36.68
08:09:51	22.77	51.11	28.35	10:27:11	22.43	59.49	37.06
08:09:56	22.77	51.44	28.67	10:27:16	22.51	59.82	37.31
08:10:01	22.82	51.74	28.93	10:27:21	22.44	60.13	37.69
08:10:06	22.82	52.07	29.25	10:27:26	22.51	60.45	37.94
08:10:11	22.75	52.45	29.70	10:27:31	22.51	60.70	38.19
08:10:16	22.75	52.77	30.02	10:27:36	22.51	61.01	38.51
08:10:21	22.75	53.08	30.33	10:27:41	22.51	61.26	38.76
08:10:26	22.82	53.39	30.58	10:27:46	22.51	61.64	39.13
08:10:31	22.80	53.69	30.89	10:27:51	22.51	61.89	39.39
08:10:36	22.80	53.94	31.15	10:27:56	22.57	62.21	39.64
08:10:41	22.80	54.26	31.46	10:28:01	22.51	62.46	39.95
08:10:46	22.80	54.57	31.77	10:28:06	22.57	62.71	40.14
08:10:51	22.80	54.89	32.09	10:28:11	22.57	63.02	40.45
08:10:56	22.78	55.12	32.34	10:28:16	22.57	63.21	40.64
08:11:01	22.78	55.44	32.65	10:28:21	22.56	63.45	40.89
08:11:06	22.72	55.75	33.03	10:28:26	22.57	63.71	41.14
08:11:11	22.70	55.92	33.22	10:28:31	22.57	63.96	41.40
08:11:16	22.77	56.24	33.47	10:28:36	22.63	64.28	41.64
08:11:21	22.77	56.49	33.72	10:28:41	22.63	64.53	41.90
08:11:26	22.70	56.74	34.04	10:28:46	22.63	64.78	42.15
08:11:31	22.77	56.99	34.23	10:28:51	22.63	64.97	42.34
08:11:36	22.69	57.23	34.54	10:28:56	22.69	65.21	42.52
08:11:41	22.75	57.48	34.73	10:29:01	22.63	65.47	42.84
08:11:46	22.73	57.71	34.98	10:29:06	22.62	65.65	43.03
08:11:51	22.73	57.90	35.17	10:29:11	22.70	65.91	43.21
08:11:56	22.73	58.22	35.48	10:29:16	22.70	66.10	43.40
08:12:01	22.73	58.41	35.67	10:29:21	22.76	66.35	43.59
08:12:06	22.73	58.72	35.99	10:29:26	22.76	66.54	43.78
08:12:11	22.72	58.89	36.17	10:29:31	22.76	66.73	43.97
08:12:16	22.78	59.08	36.30	10:29:36	22.76	66.98	44.22
08:12:21	22.72	59.33	36.61	10:29:41	22.76	67.17	44.41
08:12:26	22.78	59.58	36.80	10:29:46	22.83	67.36	44.53
08:12:31	22.70	59.76	37.05	10:29:51	22.83	67.55	44.72
08:12:36	22.70	59.94	37.24	10:29:56	22.83	67.67	44.84
08:12:41	22.77	60.20	37.43	10:30:01	22.83	67.92	45.10
08:12:46	22.77	60.38	37.62	10:30:06	22.82	68.04	45.22

Table 7 (continued)

08:12:51	22.75	60.56	37.81	10:30:11	22.83	68.30	45.47
08:12:56	22.75	60.81	38.06	10:30:16	22.83	68.49	45.66
08:13:01	22.75	61.06	38.31	10:30:21	22.89	68.61	45.72
08:13:06	22.75	61.25	38.50	10:30:26	22.89	68.80	45.91
08:13:11	22.73	61.36	38.62	10:30:31	22.82	68.98	46.16
08:13:16	22.73	61.61	38.88	10:30:36	22.88	69.11	46.22
08:13:21	22.78	61.84	39.06	10:30:41	22.96	69.31	46.35
08:13:26	22.78	61.97	39.19	10:30:46	23.02	69.43	46.41
08:13:31	22.72	62.16	39.44	10:30:51	22.94	69.60	46.66
08:13:36	22.76	62.33	39.57	10:30:56	22.94	69.79	46.85
08:13:41	22.76	62.52	39.75	10:31:01	23.02	69.93	46.91
08:13:46	22.76	62.71	39.94	10:31:06	23.01	70.17	47.16
08:13:51	22.76	62.90	40.13	10:31:11	23.01	70.23	47.23
08:13:56	22.75	63.01	40.26	10:31:16	23.01	70.42	47.42
08:14:01	22.81	63.20	40.38	10:31:21	23.01	70.55	47.54
08:14:06	22.75	63.38	40.64	10:31:26	23.07	70.74	47.67
08:14:11	22.75	63.57	40.82	10:31:31	23.07	70.86	47.79
08:14:16	22.75	63.76	41.01	10:31:36	23.01	71.05	48.04
08:14:21	22.86	63.87	41.01	10:31:41	23.07	71.18	48.11
08:14:26	22.80	64.12	41.32	10:31:46	23.07	71.30	48.23
08:14:31	22.80	64.25	41.45	10:31:51	23.07	71.49	48.42
08:14:36	22.78	64.36	41.58	10:31:56	23.07	71.55	48.48
08:14:41	22.84	64.61	41.76	10:32:01	23.13	71.74	48.61
08:14:46	22.84	64.73	41.89	10:32:06	23.07	71.87	48.80
08:14:51	22.83	64.91	42.08	10:32:11	23.13	71.99	48.86
08:14:56	22.83	65.03	42.20	10:32:16	23.13	72.12	48.98
08:15:01	22.83	65.22	42.39	10:32:21	23.13	72.24	49.11
08:15:06	22.89	65.35	42.45	10:32:26	23.13	72.43	49.30
08:15:11	22.83	65.47	42.64	10:32:31	23.13	72.56	49.42
08:15:16	22.88	65.64	42.77	10:32:36	23.26	72.68	49.42
08:15:21	22.88	65.77	42.89	10:32:41	23.20	72.81	49.61
08:15:26	22.88	65.96	43.08	10:32:46	23.26	72.93	49.67
08:15:31	22.94	66.15	43.21	10:32:51	23.26	73.06	49.80
08:15:36	22.86	66.19	43.33	10:32:56	23.20	73.19	49.99
08:15:41	22.86	66.38	43.52	10:33:01	23.26	73.31	50.05
08:15:46	22.93	66.57	43.65	10:33:06	23.25	73.43	50.17
08:15:51	22.99	66.70	43.71	10:33:11	23.32	73.55	50.23
08:15:56	22.91	66.81	43.90	10:33:16	23.33	73.63	50.30
08:16:01	22.91	66.93	44.02	10:33:21	23.26	73.75	50.49
08:16:06	23.04	67.06	44.02	10:33:26	23.33	73.94	50.61
08:16:11	23.02	67.17	44.15	10:33:31	23.33	74.00	50.67
08:16:16	23.02	67.36	44.34	10:33:36	23.33	74.13	50.80
08:16:21	23.02	67.48	44.46	10:33:41	23.33	74.25	50.93
08:16:26	22.96	67.61	44.65	10:33:46	23.39	74.38	50.99
08:16:31	23.01	67.72	44.71	10:33:51	23.39	74.51	51.11

Table 7 (continued)

08:16:36	23.01	67.84	44.84	10:33:56	23.39	74.57	51.18
08:16:41	23.07	67.97	44.90	10:34:01	23.39	74.69	51.30
08:16:46	23.07	68.16	45.09	10:34:06	23.46	74.82	51.36
08:16:51	23.05	68.27	45.21	10:34:11	23.46	74.88	51.43
08:16:56	23.05	68.39	45.34	10:34:16	23.46	75.07	51.61
08:17:01	23.05	68.46	45.40	10:34:21	23.52	75.13	51.61
08:17:06	23.10	68.63	45.53	10:34:26	23.51	75.25	51.74
08:17:11	23.12	68.77	45.65	10:34:31	23.52	75.32	51.80
08:17:16	23.10	68.82	45.72	10:34:36	23.52	75.45	51.93
08:17:21	23.10	68.94	45.84	10:34:41	23.52	75.57	52.05
08:17:26	23.10	69.13	46.03	10:34:46	23.59	75.70	52.11
08:17:31	23.17	69.26	46.09	10:34:51	23.65	75.76	52.11
08:17:36	23.15	69.37	46.22	10:34:56	23.65	75.89	52.24
08:17:41	23.21	69.43	46.21	10:35:01	23.64	75.94	52.30
08:17:46	23.21	69.56	46.34	10:35:06	23.72	76.08	52.36
08:17:51	23.21	69.68	46.47	10:35:11	23.72	76.14	52.42
08:17:56	23.26	69.79	46.53	10:35:16	23.71	76.19	52.49
08:18:01	23.26	69.92	46.65	10:35:21	23.71	76.32	52.61
08:18:06	23.26	70.04	46.78	10:35:26	23.71	76.44	52.74
08:18:11	23.33	70.17	46.84	10:35:31	23.72	76.58	52.86
08:18:16	23.33	70.23	46.90	10:35:36	23.78	76.64	52.86
08:18:21	23.38	70.34	46.96	10:35:41	23.78	76.77	52.99
08:18:26	23.38	70.40	47.03	10:35:46	23.78	76.83	53.05
08:18:31	23.38	70.53	47.15	10:35:51	23.72	76.20	52.49
08:18:36	23.44	70.65	47.21	10:35:56	23.78	75.95	52.17
08:18:41	23.44	70.78	47.34	10:36:01	23.84	76.89	53.05
08:18:46	23.42	70.83	47.40	10:36:06	23.91	77.33	53.42
08:18:51	23.42	70.95	47.53	10:36:11	23.91	77.52	53.61
08:18:56	23.49	71.02	47.53	10:36:16	23.97	77.65	53.67
08:19:01	23.55	71.14	47.59	10:36:21	23.97	77.71	53.74
08:19:06	23.47	71.25	47.78	10:36:26	23.97	77.90	53.93
08:19:11	23.55	71.33	47.78	10:36:31	23.97	77.90	53.93
08:19:16	23.54	71.44	47.90	10:36:36	24.04	78.09	54.05
08:19:21	23.54	71.50	47.97	10:36:41	24.04	78.15	54.11
08:19:26	23.60	71.63	48.03	10:36:46	24.04	78.34	54.30
08:19:31	23.60	71.75	48.15	10:36:51	24.10	78.34	54.24
08:19:36	23.60	71.88	48.28	10:36:56	24.10	78.53	54.42
08:19:41	23.67	71.94	48.28	10:37:01	24.10	78.53	54.42
08:19:46	23.65	72.05	48.40	10:37:06	24.10	78.65	54.55
08:19:51	23.71	72.11	48.40	10:37:11	24.17	78.84	54.67
08:19:56	23.71	72.24	48.53	10:37:16	24.23	78.84	54.61
08:20:01	23.71	72.30	48.59	10:37:21	24.17	78.97	54.80
08:20:06	23.78	72.37	48.59	10:37:26	24.17	79.03	54.86
08:20:11	23.76	72.48	48.71	10:37:31	24.23	79.09	54.86
08:20:16	23.78	72.62	48.84	10:37:36	24.23	79.22	54.99

Table 7 (continued)

08:20:21	23.83	72.73	48.90	10:37:41	24.30	79.28	54.98
08:20:26	23.83	72.79	48.96	10:37:46	24.36	79.34	54.98
08:20:31	23.83	72.92	49.09	10:37:51	24.43	79.47	55.04
08:20:36	23.89	72.98	49.09	10:37:56	24.43	79.53	55.11
08:20:41	23.88	73.03	49.15	10:38:01	24.49	79.66	55.17
08:20:46	23.94	73.15	49.21	10:38:06	24.43	79.72	55.30
08:20:51	23.94	73.21	49.27	10:38:11	24.49	79.78	55.29
08:20:55	23.94	73.28	49.34	10:38:16	24.56	79.85	55.29
08:21:00	23.94	73.34	49.40	10:38:21	24.61	79.90	55.29
08:21:05	24.00	73.47	49.46	10:38:26	24.56	79.97	55.42
08:21:11	23.99	73.58	49.59	10:38:31	24.62	80.10	55.48
08:21:16	24.05	73.64	49.59	10:38:36	24.62	80.16	55.54
08:21:21	24.05	73.70	49.65	10:38:41	24.68	80.16	55.48
08:21:26	24.05	73.83	49.77	10:38:46	24.62	80.29	55.67
08:21:31	24.12	73.89	49.77	10:38:51	24.62	80.35	55.73
08:21:36	24.12	73.95	49.84	10:38:56	24.68	80.35	55.67
08:21:41	24.17	74.00	49.83	10:39:01	24.67	80.40	55.73
08:21:46	24.18	74.14	49.96	10:39:06	24.81	80.54	55.72
08:21:51	24.23	74.19	49.96	10:39:11	24.77	80.62	55.85
08:21:56	24.17	74.25	50.09	10:39:16	24.77	80.74	55.98
08:22:01	24.23	74.38	50.15	10:39:21	24.83	80.74	55.91
08:22:06	24.23	74.44	50.21	10:39:26	24.81	80.79	55.98
08:22:11	24.29	74.50	50.21	10:39:31	24.83	80.87	56.04
08:22:16	24.29	74.63	50.33	10:39:36	24.81	80.98	56.16
08:22:21	24.29	74.63	50.33	10:39:41	24.83	81.06	56.23
08:22:26	24.34	74.74	50.39	10:39:46	24.96	81.12	56.16
08:22:31	24.41	74.74	50.33	10:39:51	24.96	81.18	56.22
08:22:36	24.41	74.80	50.39	10:39:56	24.93	81.16	56.22
08:22:41	24.41	74.93	50.52	10:40:01	24.89	81.31	56.41
08:22:46	24.47	75.05	50.58	10:40:06	24.96	81.37	56.41
08:22:51	24.47	75.11	50.64	10:40:11	25.02	81.43	56.41
08:22:56	24.47	75.18	50.71	10:40:16	25.01	81.48	56.47
08:23:01	24.52	75.22	50.70	10:40:21	25.02	81.62	56.60
08:23:06	24.52	75.29	50.77	10:40:26	25.09	81.62	56.53
08:23:11	24.52	75.35	50.83	10:40:31	25.15	81.69	56.53
08:23:16	24.65	75.48	50.83	10:40:36	25.09	81.81	56.72
08:23:21	24.65	75.54	50.89	10:40:41	25.15	81.87	56.72
08:23:26	24.65	75.60	50.95	10:40:46	25.15	81.87	56.72
08:23:30	24.65	75.66	51.01	10:40:51	25.22	82.00	56.78
08:23:35	24.71	75.73	51.01	10:40:56	25.22	82.06	56.84
08:23:40	24.71	75.79	51.08	10:41:01	25.28	82.13	56.84
08:23:45	24.78	75.85	51.07	10:41:06	25.28	82.19	56.91
08:23:50	24.76	75.96	51.20	10:41:11	25.22	82.25	57.03
08:23:55	24.76	75.96	51.20	10:41:16	25.28	82.25	56.97
08:24:00	24.83	76.09	51.26	10:41:21	25.35	82.38	57.03

Table 7 (continued)

08:24:05	24.83	76.15	51.32	10:41:26	25.35	82.38	57.03
08:24:10	24.89	76.21	51.32	10:41:31	25.41	82.50	57.09
08:24:15	24.89	76.34	51.45	10:41:36	25.43	82.52	57.09
08:24:20	24.94	76.32	51.38	10:41:41	25.35	82.56	57.22
08:24:25	24.89	76.46	51.57	10:41:46	25.41	82.63	57.22
08:24:30	24.96	76.46	51.51	10:41:51	25.48	82.69	57.22
08:24:35	25.00	76.51	51.51	10:41:56	25.48	82.75	57.28
08:24:40	25.00	76.57	51.57	10:42:01	25.48	82.75	57.28
08:24:45	25.00	76.64	51.63	10:42:06	25.54	82.82	57.28
08:24:50	25.13	76.76	51.63	10:42:11	25.53	82.87	57.34
08:24:55	25.07	76.83	51.76	10:42:16	25.54	82.94	57.40
08:25:00	25.13	76.89	51.76	10:42:21	25.60	83.00	57.40
08:25:05	25.20	76.95	51.75	10:42:26	25.60	83.00	57.40
08:25:10	25.12	77.00	51.88	10:42:31	25.60	83.07	57.46
08:25:15	25.12	77.06	51.94	10:42:36	25.60	83.13	57.53
08:25:20	25.12	77.06	51.94	10:42:41	25.67	83.19	57.52
08:25:25	25.25	77.12	51.88	10:42:46	25.67	83.19	57.52
08:25:30	25.18	77.19	52.01	10:42:51	25.73	83.32	57.59
08:25:35	25.17	77.30	52.13	10:42:56	25.67	83.38	57.71
08:25:41	25.23	77.30	52.07	10:43:01	25.80	83.38	57.58
08:25:46	25.29	77.36	52.07	10:43:06	25.73	83.44	57.71
08:25:51	25.29	77.42	52.13	10:43:11	25.73	83.51	57.77
08:25:56	25.36	77.49	52.13	10:43:16	25.72	83.31	57.58
08:26:01	25.36	77.55	52.19	10:43:21	25.80	82.94	57.14
08:26:05	25.41	77.60	52.19	10:43:26	25.79	82.80	57.02
08:26:10	25.42	77.74	52.31	10:43:31	25.80	82.00	56.20
08:26:15	25.41	77.72	52.31	10:43:36	25.86	81.81	55.95
08:26:20	25.42	77.80	52.38	10:43:41	25.93	81.81	55.88
08:26:25	25.41	77.85	52.44	10:43:46	25.93	81.87	55.95
08:26:30	25.47	77.91	52.44	10:43:51	25.86	81.94	56.07
08:26:35	25.47	77.91	52.44	10:43:56	25.99	82.13	56.13
08:26:40	25.46	78.02	52.56	10:44:01	25.99	82.06	56.07
08:26:45	25.58	78.02	52.43	10:44:06	25.99	81.43	55.44
08:26:50	25.52	78.14	52.62	10:44:11	25.99	81.25	55.25
08:26:55	25.58	78.21	52.62	10:44:16	26.06	81.31	55.25
08:27:00	25.58	78.21	52.62	10:44:21	26.06	81.43	55.38
08:27:05	25.58	78.27	52.69	10:44:26	26.06	81.56	55.50
08:27:10	25.71	78.33	52.62	10:44:31	26.12	81.75	55.63
08:27:15	25.71	78.40	52.68	10:44:36	26.19	81.81	55.63
08:27:20	25.71	78.46	52.75	10:44:41	26.19	81.94	55.75
08:27:25	25.70	78.44	52.75	10:44:46	26.19	82.13	55.94
08:27:30	25.76	78.51	52.74	10:44:51	26.25	82.19	55.94
08:27:35	25.76	78.57	52.81	10:44:55	26.31	82.31	56.00
08:27:40	25.83	78.63	52.81	10:45:00	26.31	82.44	56.12
08:27:45	25.89	78.69	52.80	10:45:05	26.31	82.56	56.25

Table 7 (continued)

08:27:50	25.89	78.76	52.87	10:45:10	26.31	82.63	56.31
08:27:55	25.89	78.82	52.93	10:45:15	26.31	82.75	56.44
08:28:00	25.87	78.87	52.99	10:45:20	26.25	82.88	56.63
08:28:05	25.94	78.87	52.93	10:45:25	26.25	82.94	56.69
08:28:10	25.94	78.99	53.05	10:45:30	26.37	83.06	56.69
08:28:15	26.00	78.99	52.99	10:45:35	26.44	83.13	56.69
08:28:20	26.07	79.06	52.99	10:45:40	26.44	83.19	56.75
08:28:25	26.08	79.13	53.05	10:45:45	26.44	83.32	56.87
08:28:30	26.13	79.18	53.05	10:45:50	26.43	83.37	56.94
08:28:35	26.13	79.24	53.11	10:45:55	26.51	83.44	56.94
08:28:40	26.18	79.23	53.05	10:46:00	26.44	83.57	57.13
08:28:45	26.18	79.29	53.11	10:46:05	26.51	83.63	57.12
08:28:50	26.25	79.29	53.05	10:46:10	26.57	83.70	57.12
08:28:55	26.25	79.35	53.11	10:46:15	26.64	83.76	57.12
08:29:00	26.25	79.42	53.17	10:46:20	26.57	83.82	57.25
08:29:05	26.25	79.48	53.23	10:46:26	26.57	83.88	57.31
08:29:10	26.31	79.54	53.23	10:46:31	26.57	84.01	57.44
08:29:15	26.31	79.54	53.23	10:46:36	26.51	84.01	57.50
08:29:20	26.37	79.60	53.23	10:46:41	26.57	84.07	57.50
08:29:25	26.25	79.67	53.42	10:46:46	26.65	84.15	57.50
08:29:30	26.37	79.73	53.36	10:46:51	26.72	84.21	57.50
08:29:35	26.37	79.79	53.42	10:46:56	26.70	84.26	57.56
08:29:40	26.44	79.79	53.35	10:47:01	26.77	84.39	57.62
08:29:45	26.42	79.84	53.42	10:47:06	26.64	84.39	57.75
08:29:50	26.43	79.91	53.48	10:47:11	26.78	84.47	57.68
08:29:55	26.42	79.97	53.54	10:47:16	26.85	84.47	57.62
08:30:00	26.49	79.97	53.48	10:47:21	26.85	84.59	57.74
08:30:05	26.55	80.03	53.48	10:47:26	26.85	84.59	57.74
08:30:10	26.50	80.04	53.54	10:47:30	26.91	84.65	57.74
08:30:15	26.62	80.15	53.54	10:47:35	26.90	84.70	57.81
08:30:20	26.62	80.15	53.54	10:47:40	26.91	84.78	57.87
08:30:25	26.54	80.20	53.67	10:47:45	27.04	84.84	57.80
08:30:30	26.62	80.22	53.60	10:47:50	26.98	84.91	57.93
08:30:35	26.68	80.28	53.60	10:47:55	26.98	84.97	57.99
08:30:40	26.75	80.34	53.60	10:48:00	26.97	84.96	57.99
08:30:45	26.73	80.33	53.60	10:48:05	27.04	85.09	58.05
08:30:50	26.79	80.39	53.60	10:48:10	27.04	85.09	58.05
08:30:55	26.79	80.45	53.66	10:48:15	27.11	85.09	57.99
08:31:00	26.86	80.52	53.66	10:48:20	27.04	85.16	58.12
08:31:05	26.86	80.52	53.66	10:48:25	27.04	85.22	58.18
08:31:10	26.92	80.58	53.66	10:48:30	27.04	85.28	58.24
08:31:15	26.99	80.64	53.65	10:48:35	27.11	85.28	58.18
08:31:20	26.99	80.64	53.65	10:48:40	27.17	85.35	58.17
08:31:25	26.99	80.70	53.72	10:48:45	27.25	85.36	58.11
08:31:30	26.91	80.75	53.84	10:48:50	27.12	85.42	58.30

Table 7 (continued)

08:31:35	26.97	80.81	53.84	10:48:55	27.19	85.49	58.30
08:31:40	26.99	80.83	53.84	10:49:00	27.19	85.55	58.36
08:31:45	27.04	80.88	53.84	10:49:05	27.24	85.60	58.36
08:31:50	27.10	80.94	53.84	10:49:10	27.24	85.66	58.42
08:31:55	27.05	81.01	53.97	10:49:15	27.19	85.68	58.49
08:32:00	27.04	81.00	53.97	10:49:20	27.25	85.68	58.42
08:32:05	27.10	81.00	53.90	10:49:25	27.32	85.74	58.42
08:32:10	27.17	81.07	53.90	10:49:30	27.32	85.74	58.42
08:32:15	27.17	81.13	53.96	10:49:35	27.38	85.86	58.48
08:32:20	27.17	81.19	54.03	10:49:40	27.38	85.86	58.48
08:32:25	27.23	81.19	53.96	10:49:45	27.32	85.93	58.61
08:32:30	27.29	81.19	53.90	10:49:50	27.38	85.99	58.61
08:32:35	27.29	81.32	54.02	10:49:55	27.45	85.99	58.54
08:32:40	27.28	81.30	54.02	10:50:00	27.45	86.05	58.61
08:32:45	27.28	81.30	54.02	10:50:05	27.46	86.07	58.61
08:32:50	27.23	81.38	54.15	10:50:10	27.59	86.13	58.54
08:32:55	27.36	81.38	54.02	10:50:15	27.59	86.19	58.60
08:33:00	27.28	81.43	54.15	10:50:20	27.59	86.19	58.60
08:33:05	27.34	81.43	54.08	10:50:25	27.66	86.19	58.54
08:33:10	27.47	81.49	54.02	10:50:30	27.59	86.26	58.67
08:33:15	27.47	81.55	54.08	10:50:35	27.66	86.32	58.66
08:33:20	27.48	81.63	54.14	10:50:40	27.66	86.38	58.73
08:33:25	27.54	81.68	54.14	10:50:45	27.66	86.38	58.73
08:33:30	27.54	81.68	54.14	10:50:50	27.66	86.45	58.79
08:33:35	27.54	81.74	54.20	10:50:55	27.72	86.45	58.73
08:33:40	27.54	81.74	54.20	10:51:00	27.72	86.51	58.79
08:33:45	27.60	81.80	54.20	10:51:05	27.72	86.51	58.79
08:33:50	27.60	81.80	54.20	10:51:10	27.80	86.59	58.79
08:33:55	27.60	81.87	54.27	10:51:15	27.78	86.57	58.79
08:34:00	27.60	81.87	54.27	10:51:20	27.78	86.63	58.85
08:34:05	27.68	81.94	54.27	10:51:25	27.78	86.63	58.85
08:34:10	27.61	81.94	54.33	10:51:30	27.80	86.65	58.85
08:34:15	27.67	81.99	54.33	10:51:35	27.87	86.71	58.85
08:34:20	27.67	82.06	54.39	10:51:40	27.87	86.78	58.91
08:34:25	27.65	82.04	54.39	10:51:45	27.87	86.78	58.91
08:34:30	27.66	82.11	54.45	10:51:50	27.87	86.84	58.97
08:34:35	27.78	82.10	54.32	10:51:55	27.87	86.90	59.04
08:34:40	27.78	82.16	54.39	10:52:00	27.87	86.90	59.04
08:34:45	27.84	82.23	54.38	10:52:05	27.93	86.96	59.03
08:34:50	27.78	82.23	54.45	10:52:10	27.99	86.90	58.91
08:34:55	27.85	82.30	54.45	10:52:15	27.93	86.96	59.03
08:35:00	27.84	82.29	54.45	10:52:20	27.99	87.09	59.10
08:35:05	27.91	82.35	54.45	10:52:25	27.93	87.03	59.10
08:35:10	27.92	82.43	54.51	10:52:30	28.01	87.04	59.03
08:35:15	27.92	82.43	54.51	10:52:35	28.01	87.17	59.16

Table 7 (continued)

08:35:20	27.91	82.42	54.51	10:52:40	27.95	87.17	59.22
08:35:25	27.98	82.49	54.51	10:52:45	28.00	87.16	59.16
08:35:30	27.97	82.54	54.57	10:52:50	28.01	87.23	59.22
08:35:35	28.04	82.54	54.51	10:52:55	28.01	87.29	59.28
08:35:40	28.05	82.62	54.57	10:53:00	28.08	87.29	59.22
08:35:45	28.10	82.67	54.57	10:53:05	28.01	87.29	59.28
08:35:50	28.10	82.67	54.57	10:53:10	28.14	87.36	59.22
08:35:55	28.09	82.66	54.57	10:53:15	28.13	87.35	59.22
08:36:00	28.17	82.73	54.56	10:53:20	28.16	87.37	59.22
08:36:05	28.18	82.74	54.57	10:53:25	28.22	87.44	59.21
08:36:10	28.17	82.79	54.63	10:53:30	28.20	87.48	59.28
08:36:15	28.15	82.78	54.63	10:53:35	28.22	87.50	59.28
08:36:20	28.21	82.84	54.63	10:53:40	28.28	87.49	59.21
08:36:25	28.21	82.84	54.63	10:53:45	28.28	87.55	59.27
08:36:30	28.29	82.85	54.56	10:53:50	28.29	87.56	59.28
08:36:35	28.21	82.90	54.69	10:53:55	28.34	87.61	59.27
08:36:40	28.34	82.97	54.62	10:54:00	28.22	87.62	59.40
08:36:45	28.34	83.03	54.69	10:54:05	28.35	87.69	59.34
08:36:50	28.34	83.03	54.69	10:54:10	28.35	87.75	59.40
08:36:55	28.34	83.09	54.75	10:54:15	28.30	87.77	59.46
08:37:00	28.41	83.09	54.68	10:54:20	28.37	87.77	59.40
08:37:05	28.42	83.17	54.75	10:54:25	28.37	87.77	59.40
08:37:10	28.41	83.15	54.75	10:54:30	28.37	87.83	59.46
08:37:15	28.47	83.22	54.74	10:54:35	28.43	87.89	59.46
08:37:20	28.47	83.22	54.74	10:54:40	28.37	87.83	59.46
08:37:25	28.42	83.23	54.81	10:54:45	28.36	87.94	59.59
08:37:30	28.46	83.26	54.81	10:54:50	28.37	87.89	59.53
08:37:35	28.47	83.28	54.81	10:54:55	28.50	87.95	59.46
08:37:40	28.54	83.28	54.74	10:55:00	28.50	87.95	59.46
08:37:45	28.47	83.34	54.87	10:55:05	28.50	88.02	59.52
08:37:50	28.47	83.41	54.93	10:55:10	28.58	88.10	59.52
08:37:55	28.60	83.41	54.80	10:55:15	28.50	88.08	59.58
08:38:00	28.67	83.47	54.80	10:55:20	28.51	88.10	59.58
08:38:05	28.67	83.47	54.80	10:55:25	28.51	88.10	59.58
08:38:10	28.66	83.46	54.80	10:55:30	28.51	88.16	59.65
08:38:15	28.71	83.52	54.80	10:55:35	28.58	88.22	59.65
08:38:20	28.71	83.52	54.80	10:55:40	28.57	88.21	59.64
08:38:25	28.65	83.58	54.93	10:55:45	28.57	88.21	59.64
08:38:30	28.71	83.58	54.86	10:55:50	28.64	88.22	59.58
08:38:35	28.72	83.72	54.99	10:55:55	28.58	88.22	59.65
08:38:40	28.71	83.64	54.93	10:56:00	28.71	88.35	59.64
08:38:45	28.78	83.70	54.93	10:56:05	28.57	88.27	59.71
08:38:50	28.78	83.77	54.99	10:56:10	28.71	88.35	59.64
08:38:55	28.85	83.78	54.92	10:56:15	28.77	88.41	59.64
08:39:00	28.84	83.77	54.92	10:56:20	28.76	88.40	59.64

Table 7 (continued)

08:39:05	28.85	83.84	54.99	10:56:25	28.72	88.43	59.70
08:39:10	28.84	83.83	54.99	10:56:30	28.85	88.49	59.64
08:39:15	28.84	83.89	55.05	10:56:35	28.85	88.49	59.64
08:39:20	28.91	83.89	54.98	10:56:40	28.92	88.49	59.57
08:39:25	28.97	83.95	54.98	10:56:45	28.92	88.55	59.64
08:39:30	28.90	83.95	55.05	10:56:50	28.92	88.55	59.64
08:39:35	28.98	83.97	54.98	10:56:55	28.84	88.54	59.70
08:39:40	28.89	84.00	55.11	10:57:00	28.92	88.61	59.70
08:39:45	28.89	84.07	55.17	10:57:05	28.85	88.61	59.76
08:39:50	28.89	84.07	55.17	10:57:10	28.92	88.68	59.76
08:39:55	28.96	84.07	55.11	10:57:15	28.92	88.68	59.76
08:40:00	29.02	84.07	55.04	10:57:20	28.92	88.68	59.76
08:40:05	29.02	84.13	55.11	10:57:25	28.85	88.74	59.89
08:40:10	29.02	84.19	55.17	10:57:30	28.92	88.74	59.82
08:40:15	29.09	84.19	55.11	10:57:35	28.91	88.79	59.89
08:40:20	29.09	84.19	55.11	10:57:40	28.85	88.80	59.95
08:40:25	29.09	84.25	55.17	10:57:45	28.93	88.82	59.89
08:40:30	29.15	84.32	55.17	10:57:50	29.00	88.88	59.89
08:40:35	29.20	84.30	55.10	10:57:55	29.04	88.87	59.82
08:40:40	29.13	84.30	55.17	10:58:00	28.98	88.87	59.89
08:40:45	29.20	84.30	55.10	10:58:05	29.11	88.93	59.82
08:40:50	29.21	84.37	55.17	10:58:10	29.18	88.93	59.75
08:40:55	29.21	84.37	55.17	10:58:15	29.06	88.94	59.88
08:41:00	29.14	84.44	55.29	10:58:20	29.06	88.94	59.88
08:41:05	29.26	84.43	55.16	10:58:25	29.06	89.01	59.95
08:41:10	29.34	84.50	55.16	10:58:30	29.06	89.01	59.95
08:41:15	29.27	84.50	55.23	10:58:35	29.13	89.01	59.88
				10:58:40	29.19	89.07	59.88
				10:58:45	29.25	89.07	59.82
				10:58:50	29.19	89.13	59.94
				10:58:55	29.19	89.13	59.94
				10:59:00	29.19	89.20	60.01
				10:59:05	29.25	89.20	59.94
				10:59:10	29.31	89.18	59.87
				10:59:15	29.32	89.26	59.94
				10:59:20	29.31	89.25	59.94
				10:59:25	29.31	89.25	59.94
				10:59:30	29.32	89.32	60.00
				10:59:35	29.32	89.32	60.00
				10:59:40	29.38	89.32	59.94
				10:59:45	29.24	89.31	60.07
				10:59:50	29.24	89.31	60.07
				10:59:55	29.32	89.38	60.07
				11:00:00	29.32	89.38	60.07
				11:00:05	29.32	89.38	60.07

Table 7 (continued)

					11:00:10	29.38	89.45		60.06
					11:00:15	29.38	89.45		60.06
					11:00:20	29.37	89.49		60.13
					11:00:25	29.37	89.50		60.12
					11:00:30	29.31	89.50		60.19
					11:00:35	29.45	89.57		60.12
					11:00:40	29.45	89.51		60.06
					11:00:45	29.45	89.57		60.12
					11:00:50	29.51	89.64		60.12
					11:00:55	29.50	89.62		60.12
					11:01:00	29.51	89.57		60.06
					11:01:05	29.51	89.64		60.12

Table 8: Test Data for 225°C and 300°C Cured Butter-Board

Time	Ch 0	Ch 1	Temp	Time	Ch 2	Ch 3	Temp
	Top	Bottom	Diff °C		Bottom	Top	Diff °C
	BB 225	BB 225	BB 225		BB 300	BB 300	BB 300
09:12:06	23.60	27.22	3.62	08:57:28	25.04	22.52	2.52
09:12:11	23.60	27.61	4.00	08:57:33	25.17	22.45	2.71
09:12:16	23.58	28.03	4.46	08:57:38	25.73	22.44	3.29
09:12:20	23.60	28.71	5.10	08:57:43	26.57	22.37	4.20
09:12:25	23.60	29.29	5.68	08:57:48	27.73	22.37	5.36
09:12:30	23.60	30.00	6.39	08:57:53	28.70	22.31	6.39
09:12:35	23.54	30.64	7.10	08:57:58	29.86	22.37	7.49
09:12:40	23.52	31.34	7.81	08:58:03	30.97	22.38	8.59
09:12:45	23.54	31.93	8.39	08:58:08	32.07	22.38	9.69
09:12:50	23.53	32.70	9.17	08:58:13	33.16	22.37	10.78
09:12:55	23.60	33.36	9.75	08:58:18	34.33	22.38	11.95
09:13:00	23.60	34.07	10.46	08:58:23	35.43	22.38	13.04
09:13:05	23.53	34.70	11.17	08:58:28	36.46	22.38	14.08
09:13:10	23.54	35.36	11.82	08:58:33	37.62	22.38	15.24
09:13:16	23.53	35.99	12.46	08:58:38	38.51	22.37	16.14
09:13:21	23.59	36.57	12.98	08:58:43	39.60	22.29	17.31
09:13:26	23.54	37.23	13.69	08:58:48	40.50	22.29	18.21
09:13:31	23.54	37.81	14.27	08:58:53	41.53	22.29	19.24
09:13:36	23.54	38.46	14.92	08:58:58	42.44	22.29	20.15
09:13:41	23.60	39.04	15.43	08:59:03	43.28	22.29	20.99
09:13:46	23.60	39.68	16.08	08:59:08	43.99	22.29	21.70
09:13:51	23.60	40.20	16.60	08:59:13	44.77	22.24	22.54
09:13:56	23.54	40.78	17.24	08:59:18	45.67	22.23	23.44
09:14:01	23.60	41.30	17.69	08:59:23	46.36	22.21	24.15
09:14:06	23.54	41.81	18.27	08:59:28	47.22	22.16	25.05
09:14:11	23.59	42.38	18.79	08:59:33	47.91	22.15	25.76
09:14:16	23.54	42.85	19.31	08:59:38	48.75	22.21	26.54
09:14:21	23.60	43.43	19.82	08:59:43	49.52	22.15	27.38
09:14:26	23.60	43.88	20.28	08:59:48	50.36	22.21	28.15
09:14:31	23.66	44.32	20.66	08:59:53	51.07	22.21	28.86
09:14:36	23.60	44.85	21.24	08:59:58	51.85	22.15	29.70
09:14:41	23.60	45.37	21.76	09:00:03	52.49	22.21	30.28
09:14:46	23.67	45.75	22.08	09:00:08	53.25	22.15	31.10
09:14:51	23.60	46.27	22.67	09:00:13	53.86	22.19	31.66
09:14:55	23.67	46.72	23.05	09:00:18	54.50	22.20	32.29
09:15:00	23.60	47.17	23.57	09:00:23	55.18	22.19	32.98
09:15:05	23.66	47.62	23.96	09:00:28	55.68	22.19	33.49
09:15:10	23.67	48.08	24.41	09:00:33	56.31	22.26	34.05
09:15:15	23.67	48.47	24.80	09:00:38	56.87	22.19	34.68
09:15:20	23.67	48.85	25.18	09:00:43	57.38	22.19	35.18
09:15:25	23.67	49.30	25.64	09:00:48	58.01	22.13	35.88
09:15:30	23.67	49.63	25.96	09:00:53	58.56	22.11	36.44

Table 8 (continued)

09:15:35	23.73	50.02	26.28	09:00:58	59.06	22.18	36.88
09:15:40	23.73	50.47	26.73	09:01:03	59.62	22.18	37.45
09:15:45	23.67	50.85	27.19	09:01:08	60.14	22.13	38.01
09:15:50	23.66	51.23	27.57	09:01:13	60.69	22.18	38.51
09:15:55	23.67	51.56	27.90	09:01:18	61.19	22.11	39.08
09:16:00	23.67	51.95	28.28	09:01:23	61.70	22.11	39.58
09:16:05	23.67	52.28	28.61	09:01:28	62.26	22.18	40.08
09:16:10	23.67	52.66	28.99	09:01:33	62.77	22.18	40.59
09:16:15	23.67	52.97	29.30	09:01:38	63.33	22.11	41.22
09:16:20	23.67	53.28	29.62	09:01:43	63.75	22.16	41.59
09:16:25	23.72	53.52	29.80	09:01:48	64.19	22.10	42.10
09:16:30	23.73	53.85	30.12	09:01:53	64.63	22.16	42.47
09:16:35	23.73	54.16	30.43	09:01:58	65.09	22.18	42.91
09:16:40	23.73	54.48	30.74	09:02:03	65.51	22.23	43.29
09:16:45	23.73	54.73	31.00	09:02:08	65.89	22.16	43.73
09:16:50	23.73	55.04	31.31	09:02:13	66.28	22.17	44.11
09:16:55	23.73	55.29	31.56	09:02:18	66.66	22.17	44.48
09:17:00	23.72	55.54	31.81	09:02:23	67.03	22.17	44.86
09:17:05	23.67	55.92	32.25	09:02:28	67.34	22.23	45.11
09:17:10	23.75	56.13	32.38	09:02:33	67.65	22.23	45.42
09:17:15	23.80	56.43	32.63	09:02:38	67.84	22.23	45.61
09:17:20	23.75	56.63	32.88	09:02:43	67.96	22.23	45.74
09:17:25	23.75	56.94	33.19	09:02:48	68.04	22.17	45.87
09:17:30	23.75	57.13	33.38	09:02:53	68.22	22.16	46.05
09:17:35	23.75	57.45	33.70	09:02:58	68.28	22.16	46.12
09:17:40	23.81	57.70	33.88	09:03:03	68.40	22.16	46.24
09:17:45	23.75	57.95	34.20	09:03:08	68.53	22.16	46.37
09:17:50	23.74	58.19	34.45	09:03:13	68.61	22.24	46.37
09:17:55	23.81	58.39	34.58	09:03:18	68.78	22.16	46.62
09:18:00	23.81	58.64	34.83	09:03:23	68.86	22.24	46.62
09:18:05	23.75	58.89	35.14	09:03:28	69.04	22.17	46.87
09:18:10	23.75	59.08	35.33	09:03:33	69.10	22.16	46.93
09:18:15	23.80	59.32	35.52	09:03:38	69.28	22.16	47.12
09:18:20	23.81	59.46	35.64	09:03:43	69.41	22.23	47.18
09:18:25	23.80	59.70	35.89	09:03:48	69.55	22.24	47.31
09:18:30	23.80	59.95	36.15	09:03:53	69.66	22.16	47.50
09:18:35	23.81	60.09	36.27	09:03:58	69.80	22.24	47.56
09:18:40	23.81	60.34	36.52	09:04:03	70.07	22.19	47.88
09:18:45	23.88	60.46	36.58	09:04:08	70.23	22.16	48.07
09:18:50	23.81	60.71	36.90	09:04:13	70.48	22.23	48.25
09:18:55	23.81	60.90	37.09	09:04:18	70.74	22.24	48.50
09:19:00	23.80	61.08	37.28	09:04:23	70.92	22.16	48.76
09:19:05	23.81	61.28	37.47	09:04:28	71.06	22.24	48.82
09:19:10	23.88	61.47	37.59	09:04:33	71.25	22.18	49.07
09:19:15	23.81	61.66	37.84	09:04:38	71.43	22.17	49.26

Table 8 (continued)

09:19:20	23.83	61.86	38.03	09:04:43	71.61	22.23	49.38
09:19:25	23.88	62.03	38.16	09:04:48	71.73	22.16	49.57
09:19:30	23.80	62.21	38.41	09:04:53	71.81	22.18	49.64
09:19:35	23.88	62.47	38.60	09:04:58	71.95	22.19	49.76
09:19:40	23.88	62.60	38.72	09:05:03	72.06	22.18	49.89
09:19:45	23.88	62.85	38.97	09:05:08	72.36	22.10	50.27
09:19:50	23.90	62.99	39.10	09:05:13	72.55	22.16	50.39
09:19:55	23.88	63.17	39.29	09:05:18	72.69	22.18	50.52
09:20:00	23.90	63.37	39.47	09:05:23	72.96	22.12	50.83
09:20:05	23.87	63.53	39.66	09:05:28	73.13	22.11	51.02
09:20:10	23.88	63.67	39.79	09:05:33	73.32	22.17	51.15
09:20:15	23.88	63.86	39.98	09:05:38	73.49	22.16	51.33
09:20:20	23.94	64.05	40.10	09:05:43	73.68	22.16	51.52
09:20:25	23.94	64.17	40.23	09:05:48	73.95	22.17	51.77
09:20:30	23.88	64.36	40.48	09:05:53	74.12	22.16	51.96
09:20:35	23.94	64.48	40.54	09:05:58	74.31	22.16	52.15
09:20:40	23.94	64.67	40.73	09:06:03	74.56	22.16	52.40
09:20:45	23.94	64.86	40.92	09:06:08	74.75	22.23	52.53
09:20:50	23.96	65.00	41.04	09:06:13	75.07	22.23	52.84
09:20:55	23.96	65.19	41.23	09:06:18	75.19	22.23	52.96
09:21:00	23.96	65.32	41.36	09:06:23	75.38	22.23	53.15
09:21:05	24.02	65.51	41.48	09:06:28	75.44	22.23	53.22
09:21:10	24.02	65.63	41.61	09:06:33	75.38	22.23	53.15
09:21:15	23.96	65.76	41.80	09:06:38	75.38	22.23	53.15
09:21:20	23.94	65.93	41.99	09:06:43	75.44	22.23	53.22
09:21:25	23.96	66.07	42.11	09:06:48	75.40	22.24	53.15
09:21:30	24.02	66.26	42.24	09:06:53	75.45	22.17	53.28
09:21:35	23.96	66.39	42.43	09:06:58	75.39	22.17	53.22
09:21:40	24.02	66.57	42.55	09:07:03	75.38	22.16	53.22
09:21:45	24.02	66.70	42.68	09:07:08	75.52	22.24	53.28
09:21:50	24.02	66.83	42.80	09:07:13	75.57	22.16	53.41
09:21:55	24.09	66.89	42.80	09:07:18	75.63	22.23	53.40
09:22:00	24.09	67.08	42.99	09:07:23	75.65	22.24	53.40
09:22:05	24.02	67.27	43.24	09:07:28	75.57	22.23	53.34
09:22:10	24.02	67.33	43.30	09:07:33	75.52	22.31	53.21
09:22:15	24.09	67.45	43.37	09:07:38	75.51	22.29	53.21
09:22:20	24.09	67.64	43.55	09:07:43	75.58	22.31	53.28
09:22:25	24.09	67.77	43.68	09:07:48	75.65	22.31	53.34
09:22:30	24.09	67.89	43.81	09:07:53	75.65	22.31	53.34
09:22:35	24.15	68.02	43.87	09:07:58	75.72	22.32	53.40
09:22:40	24.15	68.15	43.99	09:08:03	75.76	22.29	53.47
09:22:45	24.14	68.26	44.12	09:08:08	75.77	22.24	53.53
09:22:50	24.15	68.40	44.24	09:08:13	75.83	22.24	53.59
09:22:55	24.15	68.52	44.37	09:08:18	75.76	22.23	53.53
09:23:00	24.15	68.65	44.49	09:08:23	75.90	22.24	53.66

Table 8 (continued)

09:23:05	24.22	68.77	44.56	09:08:28	75.84	22.24	53.59
09:23:10	24.21	68.89	44.68	09:08:33	75.90	22.18	53.72
09:23:15	24.15	69.03	44.87	09:08:38	76.02	22.24	53.78
09:23:20	24.14	69.14	45.00	09:08:43	76.16	22.25	53.91
09:23:25	24.22	69.28	45.06	09:08:48	76.32	22.23	54.10
09:23:30	24.20	69.39	45.18	09:08:53	76.46	22.24	54.22
09:23:35	24.28	69.53	45.25	09:08:58	76.66	22.25	54.41
09:23:40	24.28	69.59	45.31	09:09:03	76.84	22.24	54.60
09:23:45	24.34	69.71	45.37	09:09:08	76.82	22.16	54.66
09:23:50	24.26	69.82	45.56	09:09:13	76.89	22.23	54.66
09:23:55	24.28	69.90	45.62	09:09:18	76.90	22.30	54.60
09:24:00	24.34	70.08	45.74	09:09:23	76.90	22.31	54.60
09:24:05	24.28	70.16	45.87	09:09:28	76.89	22.29	54.60
09:24:10	24.34	70.21	45.87	09:09:33	76.89	22.23	54.66
09:24:15	24.34	70.40	46.06	09:09:38	76.95	22.29	54.66
09:24:20	24.41	70.47	46.06	09:09:43	76.82	22.29	54.53
09:24:25	24.35	70.60	46.25	09:09:48	76.82	22.29	54.53
09:24:30	24.40	70.71	46.31	09:09:53	76.82	22.29	54.53
09:24:35	24.40	70.77	46.37	09:09:58	76.82	22.29	54.53
09:24:40	24.35	70.91	46.56	09:10:03	76.90	22.43	54.47
09:24:45	24.41	71.04	46.62	09:10:08	76.89	22.36	54.53
09:24:50	24.48	71.10	46.62	09:10:13	77.08	22.36	54.72
09:24:55	24.48	71.22	46.75	09:10:18	77.20	22.36	54.85
09:25:00	24.47	71.28	46.81	09:10:23	77.33	22.42	54.91
09:25:05	24.48	71.41	46.94	09:10:28	77.45	22.42	55.03
09:25:10	24.54	71.48	46.93	09:10:33	77.58	22.42	55.16
09:25:15	24.48	71.60	47.13	09:10:38	77.64	22.42	55.22
09:25:20	24.48	71.66	47.19	09:10:43	77.70	22.42	55.28
09:25:25	24.54	71.79	47.25	09:10:48	77.70	22.42	55.28
09:25:30	24.54	71.92	47.37	09:10:53	77.70	22.42	55.28
09:25:35	24.54	71.98	47.44	09:10:58	77.64	22.42	55.22
09:25:40	24.60	72.09	47.50	09:11:03	77.65	22.49	55.16
09:25:45	24.61	72.17	47.56	09:11:08	77.72	22.56	55.16
09:25:50	24.61	72.23	47.62	09:11:13	77.89	22.48	55.41
09:25:55	24.61	72.36	47.75	09:11:18	78.03	22.49	55.54
09:26:00	24.67	72.48	47.81	09:11:23	78.21	22.48	55.72
09:26:05	24.67	72.48	47.81	09:11:28	78.33	22.48	55.85
09:26:10	24.67	72.61	47.94	09:11:33	78.58	22.48	56.10
09:26:15	24.65	72.65	48.00	09:11:38	78.71	22.48	56.23
09:26:20	24.67	72.80	48.13	09:11:43	78.90	22.55	56.35
09:26:25	24.72	72.84	48.12	09:11:48	79.09	22.48	56.60
09:26:30	24.73	72.92	48.19	09:11:53	79.21	22.48	56.73
09:26:35	24.79	73.04	48.25	09:11:58	79.41	22.49	56.92
09:26:40	24.80	73.11	48.31	09:12:03	79.54	22.49	57.04
09:26:45	24.80	73.24	48.44	09:12:08	79.66	22.49	57.17

Table 8 (continued)

09:26:50	24.86	73.24	48.37	09:12:13	79.78	22.48	57.29
09:26:55	24.80	73.42	48.62	09:12:18	79.90	22.55	57.35
09:27:00	24.80	73.49	48.69	09:12:23	80.03	22.48	57.54
09:27:05	24.80	73.55	48.75	09:12:28	80.22	22.55	57.67
09:27:10	24.86	73.61	48.75	09:12:33	80.36	22.57	57.79
09:27:15	24.86	73.74	48.87	09:12:38	80.48	22.57	57.92
09:27:20	24.93	73.80	48.87	09:12:43	80.59	22.55	58.05
09:27:25	24.92	73.85	48.93	09:12:48	80.74	22.63	58.11
09:27:30	24.99	73.99	49.00	09:12:53	80.81	22.57	58.24
09:27:35	24.99	73.99	49.00	09:12:58	80.87	22.64	58.23
09:27:40	24.99	74.12	49.12	09:13:03	80.86	22.69	58.17
09:27:45	24.93	74.12	49.19	09:13:08	81.00	22.64	58.36
09:27:50	24.99	74.24	49.25	09:13:13	81.19	22.64	58.55
09:27:55	24.92	74.23	49.31	09:13:18	81.31	22.70	58.61
09:28:00	24.99	74.37	49.37	09:13:23	81.49	22.69	58.80
09:28:05	24.98	74.42	49.43	09:13:28	81.62	22.63	58.99
09:28:10	25.06	74.55	49.50	09:13:33	81.74	22.63	59.11
09:28:15	25.06	74.62	49.56	09:13:38	81.80	22.69	59.11
09:28:20	25.06	74.62	49.56	09:13:43	81.87	22.63	59.24
09:28:25	25.06	74.74	49.69	09:13:48	81.99	22.63	59.36
09:28:30	25.06	74.74	49.69	09:13:53	82.12	22.63	59.49
09:28:35	25.12	74.87	49.75	09:13:58	82.24	22.63	59.61
09:28:40	25.19	74.93	49.75	09:14:03	82.31	22.69	59.61
09:28:45	25.12	74.99	49.87	09:14:08	82.43	22.69	59.74
09:28:50	25.18	75.11	49.93	09:14:13	82.63	22.70	59.93
09:28:55	25.25	75.18	49.93	09:14:18	82.75	22.76	59.99
09:29:00	25.25	75.18	49.93	09:14:23	82.90	22.78	60.12
09:29:05	25.25	75.31	50.06	09:14:28	83.01	22.78	60.24
09:29:10	25.31	75.30	49.99	09:14:33	83.09	22.78	60.30
09:29:15	25.25	75.43	50.18	09:14:38	83.28	22.78	60.49
09:29:20	25.32	75.50	50.18	09:14:43	83.39	22.78	60.62
09:29:25	25.29	75.47	50.18	09:14:48	83.39	22.78	60.62
09:29:30	25.32	75.62	50.31	09:14:53	83.58	22.84	60.74
09:29:35	25.32	75.69	50.37	09:14:58	83.64	22.78	60.87
09:29:40	25.38	75.75	50.37	09:15:03	83.83	22.90	60.93
09:29:45	25.37	75.80	50.43	09:15:08	83.89	22.90	60.99
09:29:50	25.38	75.87	50.49	09:15:13	84.02	22.84	61.18
09:29:55	25.38	75.94	50.56	09:15:18	84.04	22.86	61.18
09:30:00	25.51	76.00	50.49	09:15:23	84.10	22.86	61.24
09:30:05	25.45	76.06	50.62	09:15:28	84.17	22.93	61.24
09:30:10	25.51	76.13	50.62	09:15:33	84.35	25.83	58.52
09:30:15	25.48	76.16	50.68	09:15:38	84.98	24.34	60.64
09:30:20	25.51	76.25	50.74	09:15:43	85.04	23.70	61.35
09:30:25	25.51	76.31	50.80	09:15:48	85.04	23.44	61.60
09:30:30	25.57	76.31	50.74	09:15:53	85.10	23.31	61.80

Table 8 (continued)

09:30:35	25.56	76.42	50.87	09:15:58	85.19	23.21	61.99
09:30:40	25.64	76.44	50.80	09:16:03	85.17	23.05	62.12
09:30:45	25.57	76.50	50.93	09:16:08	85.18	23.00	62.18
09:30:50	25.64	76.63	50.99	09:16:13	85.23	23.05	62.18
09:30:55	25.64	76.63	50.99	09:16:18	85.31	23.07	62.24
09:31:00	25.64	76.69	51.05	09:16:23	85.25	23.07	62.18
09:31:05	25.64	76.69	51.05	09:16:28	85.19	23.01	62.18
09:31:10	25.63	76.81	51.18	09:16:33	85.12	22.94	62.18
09:31:15	25.69	76.80	51.11	09:16:38	85.06	23.00	62.06
09:31:20	25.69	76.93	51.24	09:16:43	85.07	23.08	61.99
09:31:25	25.77	76.94	51.17	09:16:48	85.06	23.07	61.99
09:31:30	25.77	77.01	51.24	09:16:53	85.12	23.07	62.05
09:31:35	25.70	77.01	51.30	09:16:58	85.18	23.07	62.12
09:31:40	25.77	77.13	51.36	09:17:03	85.18	23.00	62.18
09:31:45	25.83	77.19	51.36	09:17:08	85.19	23.08	62.12
09:31:50	25.82	77.18	51.36	09:17:13	85.26	23.15	62.11
09:31:55	25.90	77.26	51.36	09:17:18	85.15	23.09	62.05
09:32:00	25.83	77.38	51.55	09:17:23	85.01	23.08	61.93
09:32:05	25.90	77.38	51.49	09:17:28	84.82	23.08	61.74
09:32:10	25.90	77.45	51.55	09:17:33	84.70	23.08	61.61
09:32:15	25.90	77.51	51.61	09:17:38	84.57	23.08	61.49
09:32:20	25.96	77.51	51.55	09:17:43	84.32	23.08	61.24
09:32:25	25.96	77.63	51.67	09:17:48	84.19	23.08	61.11
09:32:30	26.03	77.63	51.61	09:17:53	84.00	23.08	60.92
09:32:35	26.03	77.70	51.67	09:17:58	83.88	23.15	60.73
09:32:40	26.02	77.75	51.73	09:18:03	83.69	23.15	60.54
09:32:45	26.09	77.76	51.67	09:18:08	83.64	23.09	60.55
09:32:50	26.08	77.87	51.79	09:18:13	83.44	23.02	60.42
09:32:55	25.96	77.95	51.99	09:18:18	83.31	23.08	60.23
09:33:00	26.09	78.01	51.92	09:18:23	83.19	23.08	60.11
09:33:05	26.16	77.95	51.79	09:18:28	83.06	23.08	59.98
09:33:10	26.03	78.07	52.05	09:18:33	82.94	23.08	59.85
09:33:15	26.08	78.06	51.98	09:18:38	82.87	23.15	59.73
09:33:20	26.16	78.20	52.04	09:18:43	82.75	23.08	59.67
09:33:25	26.21	78.19	51.98	09:18:48	82.68	23.15	59.54
09:33:30	26.16	78.26	52.11	09:18:53	82.75	23.02	59.73
09:33:35	26.22	78.26	52.04	09:18:58	82.79	23.13	59.66
09:33:40	26.20	78.31	52.11	09:19:03	82.87	23.15	59.73
09:33:45	26.27	78.31	52.04	09:19:08	83.05	23.13	59.92
09:33:50	26.28	78.39	52.10	09:19:13	83.11	23.13	59.98
09:33:55	26.35	78.45	52.10	09:19:18	83.31	23.15	60.17
09:34:00	26.27	78.50	52.23	09:19:23	83.44	23.15	60.29
09:34:05	26.35	78.58	52.23	09:19:28	83.58	23.16	60.42
09:34:10	26.35	78.58	52.23	09:19:33	83.69	23.08	60.61
09:34:15	26.41	78.58	52.16	09:19:38	83.82	23.21	60.60

Table 8 (continued)

09:34:20	26.41	78.64	52.23	09:19:43	83.94	23.21	60.73
09:34:25	26.35	78.70	52.35	09:19:48	84.00	23.15	60.86
09:34:30	26.40	78.75	52.35	09:19:53	84.07	23.15	60.92
09:34:35	26.47	78.75	52.29	09:19:58	84.07	23.21	60.86
09:34:40	26.39	78.74	52.35	09:20:03	84.05	23.20	60.86
09:34:45	26.48	78.89	52.41	09:20:08	84.14	23.22	60.92
09:34:50	26.54	78.95	52.41	09:20:13	84.13	23.21	60.92
09:34:55	26.54	78.89	52.35	09:20:18	84.19	23.21	60.98
09:35:00	26.53	79.00	52.47	09:20:23	84.19	23.28	60.92
09:35:05	26.54	79.02	52.47	09:20:28	84.32	23.21	61.11
09:35:10	26.60	79.01	52.41	09:20:33	84.37	23.26	61.11
09:35:15	26.54	79.08	52.54	09:20:38	84.44	23.21	61.23
09:35:20	26.60	79.13	52.53	09:20:43	84.43	23.26	61.17
09:35:25	26.67	79.20	52.53	09:20:48	84.44	23.21	61.23
09:35:30	26.67	79.27	52.60	09:20:53	84.49	23.26	61.23
09:35:35	26.67	79.27	52.60	09:20:58	84.44	23.28	61.17
09:35:40	26.74	79.27	52.53	09:21:03	84.44	23.28	61.17
09:35:45	26.67	79.39	52.72	09:21:08	84.43	23.26	61.17
09:35:50	26.67	79.33	52.66	09:21:13	84.44	23.28	61.17
09:35:55	26.74	79.39	52.66	09:21:18	84.38	23.28	61.11
09:36:00	26.77	79.43	52.65	09:21:23	84.26	23.34	60.92
09:36:05	26.72	79.44	52.72	09:21:28	84.24	23.26	60.98
09:36:10	26.80	79.52	52.72	09:21:33	84.11	23.26	60.85
09:36:15	26.79	79.51	52.72	09:21:38	84.07	23.34	60.73
09:36:20	26.79	79.57	52.78	09:21:43	83.94	23.34	60.60
09:36:25	26.87	79.64	52.78	09:21:48	83.82	23.34	60.48
09:36:30	26.80	79.64	52.84	09:21:53	83.80	23.32	60.48
09:36:35	26.74	79.71	52.97	09:21:58	83.64	23.35	60.29
09:36:40	26.85	79.75	52.91	09:22:03	83.55	23.32	60.22
09:36:45	26.87	79.83	52.97	09:22:08	83.49	23.26	60.23
09:36:50	26.86	79.82	52.97	09:22:13	83.38	23.28	60.10
09:36:55	26.93	79.90	52.97	09:22:18	83.25	23.28	59.97
09:37:00	26.92	79.95	53.03	09:22:23	83.19	23.34	59.85
09:37:05	26.99	79.96	52.96	09:22:28	83.11	23.32	59.78
09:37:10	26.99	80.02	53.03	09:22:33	83.12	23.33	59.79
09:37:15	27.05	80.01	52.96	09:22:38	83.11	23.26	59.85
09:37:20	26.99	80.08	53.09	09:22:43	83.11	23.32	59.78
09:37:25	27.04	80.13	53.09	09:22:48	83.17	23.32	59.85
09:37:30	27.06	80.15	53.09	09:22:53	83.11	23.32	59.78
09:37:35	27.06	80.21	53.15	09:22:58	83.06	23.33	59.72
09:37:40	26.98	80.26	53.28	09:23:03	83.00	23.41	59.59
09:37:45	27.06	80.27	53.21	09:23:08	82.98	23.39	59.59
09:37:50	27.06	80.34	53.28	09:23:13	83.11	23.39	59.72
09:37:55	27.11	80.32	53.21	09:23:18	83.23	23.45	59.78
09:38:00	27.12	80.40	53.27	09:23:23	83.42	23.45	59.97

Table 8 (continued)

09:38:05	27.19	80.46	53.27	09:23:28	83.49	23.39	60.10
09:38:10	27.12	80.52	53.40	09:23:33	83.67	23.45	60.22
09:38:15	27.18	80.51	53.33	09:23:38	83.86	23.39	60.47
09:38:20	27.25	80.59	53.33	09:23:43	83.93	23.39	60.54
09:38:25	27.19	80.59	53.40	09:23:48	84.05	23.45	60.60
09:38:30	27.19	80.71	53.52	09:23:53	84.11	23.45	60.66
09:38:35	27.32	80.71	53.40	09:23:58	84.13	23.40	60.73
09:38:40	27.31	80.70	53.39	09:24:03	84.05	23.39	60.66
09:38:45	27.25	80.78	53.52	09:24:08	83.86	23.39	60.47
09:38:50	27.24	80.76	53.52	09:24:13	83.74	23.45	60.28
09:38:55	27.32	80.84	53.52	09:24:18	83.61	23.39	60.22
09:39:00	27.32	80.90	53.58	09:24:23	83.42	23.39	60.03
09:39:05	27.37	80.89	53.52	09:24:28	83.30	23.45	59.84
09:39:10	27.37	80.95	53.58	09:24:33	83.17	23.45	59.72
09:39:15	27.32	80.96	53.65	09:24:38	83.05	23.52	59.53
09:39:20	27.38	80.96	53.58	09:24:43	82.92	23.45	59.47
09:39:25	27.38	81.09	53.71	09:24:48	82.86	23.52	59.34
09:39:30	27.45	81.09	53.64	09:24:53	82.79	23.52	59.28
09:39:35	27.45	81.15	53.71	09:24:58	82.79	23.45	59.34
09:39:40	27.45	81.15	53.71	09:25:03	82.79	23.45	59.34
09:39:45	27.45	81.22	53.77	09:25:08	82.86	23.45	59.40
09:39:50	27.45	81.22	53.77	09:25:13	82.86	23.45	59.40
09:39:55	27.50	81.27	53.77	09:25:18	82.92	23.45	59.47
09:40:00	27.51	81.28	53.77	09:25:23	82.86	23.52	59.34
09:40:05	27.58	81.28	53.70	09:25:28	82.92	23.45	59.47
09:40:10	27.64	81.40	53.76	09:25:33	82.79	23.45	59.34
09:40:15	27.62	81.33	53.70	09:25:38	82.67	23.52	59.15
09:40:20	27.64	81.40	53.76	09:25:43	82.61	23.52	59.09
09:40:25	27.58	81.39	53.82	09:25:48	82.48	23.52	58.96
09:40:30	27.64	81.47	53.83	09:25:53	82.48	23.52	58.96
09:40:35	27.70	81.46	53.76	09:25:58	82.43	23.53	58.90
09:40:40	27.68	81.44	53.76	09:26:03	82.48	23.52	58.96
09:40:45	27.71	81.53	53.82	09:26:08	82.54	23.45	59.09
09:40:50	27.71	81.53	53.82	09:26:13	82.73	23.52	59.21
09:40:55	27.71	81.59	53.89	09:26:18	82.79	23.52	59.28
09:41:00	27.70	81.58	53.89	09:26:23	82.92	23.45	59.47
09:41:05	27.63	81.64	54.01	09:26:28	83.05	23.45	59.59
09:41:10	27.76	81.64	53.88	09:26:33	83.23	23.52	59.72
09:41:15	27.77	81.72	53.95	09:26:38	83.36	23.58	59.78
09:41:20	27.71	81.72	54.01	09:26:43	83.42	23.52	59.90
09:41:25	27.76	81.77	54.01	09:26:48	83.36	23.52	59.84
09:41:30	27.83	81.78	53.95	09:26:53	83.17	23.45	59.72
09:41:35	27.89	81.77	53.88	09:26:58	83.05	23.45	59.59
09:41:40	27.89	81.83	53.94	09:27:03	82.86	23.45	59.40
09:41:45	27.83	81.84	54.01	09:27:08	82.79	23.52	59.28

Table 8 (continued)

09:41:50	27.89	81.83	53.94	09:27:13	82.61	23.52	59.09
09:41:55	27.82	81.90	54.07	09:27:18	82.48	23.45	59.03
09:42:00	27.83	81.97	54.14	09:27:23	82.46	23.44	59.03
09:42:05	27.96	81.97	54.01	09:27:28	82.53	23.50	59.03
09:42:10	27.94	81.94	54.01	09:27:33	82.46	23.44	59.03
09:42:15	27.89	82.02	54.13	09:27:38	82.40	23.44	58.96
09:42:20	27.88	82.02	54.13	09:27:43	82.46	23.44	59.03
09:42:25	27.96	82.03	54.07	09:27:48	82.65	23.37	59.28
09:42:30	28.02	82.08	54.07	09:27:53	82.84	23.44	59.40
09:42:35	28.03	82.10	54.07	09:27:58	83.09	23.44	59.66
09:42:40	28.03	82.16	54.13	09:28:03	83.27	23.49	59.78
09:42:45	28.09	82.22	54.13	09:28:08	83.53	23.50	60.03
09:42:50	27.95	82.21	54.26	09:28:13	83.78	23.57	60.22
09:42:55	28.03	82.28	54.26	09:28:18	84.08	23.55	60.53
09:43:00	28.09	82.28	54.19	09:28:23	84.21	23.55	60.66
09:43:05	28.09	82.28	54.19	09:28:28	84.41	23.50	60.91
09:43:10	28.09	82.28	54.19	09:28:33	84.53	23.50	61.04
09:43:15	28.16	82.35	54.19	09:28:38	84.71	23.55	61.16
09:43:20	28.16	82.35	54.19	09:28:43	84.71	23.55	61.16
09:43:25	28.16	82.35	54.19	09:28:48	84.77	23.55	61.22
09:43:30	28.21	82.40	54.19	09:28:53	84.88	23.47	61.41
09:43:35	28.21	82.39	54.19	09:28:58	84.95	23.53	61.41
09:43:40	28.21	82.40	54.19	09:29:03	85.13	23.53	61.60
09:43:45	28.16	82.47	54.32	09:29:08	85.32	23.53	61.79
09:43:50	28.16	82.54	54.38	09:29:13	85.51	23.47	62.04
09:43:55	28.28	82.46	54.18	09:29:18	85.65	23.54	62.11
09:44:00	28.29	82.54	54.25	09:29:23	85.70	23.53	62.17
09:44:05	28.28	82.52	54.25	09:29:28	85.81	23.52	62.29
09:44:10	28.34	82.59	54.25	09:29:33	85.89	23.53	62.36
09:44:15	28.35	82.60	54.25	09:29:38	85.95	23.53	62.42
09:44:20	28.28	82.65	54.37	09:29:43	86.09	23.61	62.48
09:44:25	28.28	82.65	54.37	09:29:48	86.14	23.66	62.48
09:44:30	28.35	82.72	54.37	09:29:53	86.14	23.59	62.54
09:44:35	28.34	82.65	54.31	09:29:58	86.12	23.58	62.54
09:44:40	28.41	82.71	54.31	09:30:03	86.06	23.58	62.48
09:44:45	28.42	82.79	54.37	09:30:08	85.87	23.58	62.29
09:44:50	28.47	82.78	54.31	09:30:13	85.75	23.52	62.23
09:44:55	28.41	82.84	54.43	09:30:18	85.54	23.50	62.04
09:45:00	28.48	82.85	54.37	09:30:23	85.62	23.45	62.17
09:45:05	28.48	82.85	54.37	09:30:28	85.61	23.50	62.10
09:45:10	28.35	82.91	54.56	09:30:33	85.81	23.45	62.36
09:45:15	28.47	82.90	54.43	09:30:38	85.86	23.50	62.36
09:45:20	28.48	82.98	54.50	09:30:43	85.98	23.57	62.42
				09:30:48	86.05	23.57	62.48
				09:30:53	86.11	23.57	62.54

Table 8 (continued)

				09:30:58	86.17	23.49	62.67
				09:31:03	86.23	23.57	62.67
				09:31:08	86.22	23.48	62.73
				09:31:13	86.16	23.48	62.67
				09:31:18	86.16	23.55	62.61
				09:31:23	86.03	23.61	62.42
				09:31:28	85.90	23.55	62.35
				09:31:33	85.78	23.61	62.16
				09:31:38	85.59	23.68	61.91
				09:31:43	85.48	23.69	61.79
				09:31:48	85.34	23.74	61.60
				09:31:53	85.15	23.74	61.41
				09:31:58	85.09	23.74	61.34
				09:32:03	84.97	23.75	61.22
				09:32:08	84.90	23.81	61.09
				09:32:13	84.71	23.74	60.97
				09:32:18	84.60	23.82	60.78
				09:32:23	84.40	23.74	60.65
				09:32:28	84.21	23.81	60.40
				09:32:33	84.11	23.83	60.28
				09:32:38	83.97	23.82	60.15
				09:32:43	83.85	23.89	59.96
				09:32:48	83.72	23.89	59.83
				09:32:53	83.59	23.82	59.77
				09:32:58	83.53	23.89	59.64
				09:33:03	83.36	23.90	59.45
				09:33:08	83.25	23.91	59.33
				09:33:13	83.11	23.97	59.14
				09:33:18	82.98	23.97	59.01
				09:33:23	82.99	23.91	59.08

APPENDIX C

EPOXY/GLASS COMPOSITE (THROUGH LAYERS) THERMAL CONDUCTIVITY DATA

Table 9: Test Data for Uncured and 100°C Cured Epoxy/Glass Composite (Through Layers)

Time	Ch 2	Ch 3	Temp		Time	Ch 2	Ch 3	Temp
	Bottom EGC	Top EGC	Diff °C			Bottom	Top	Diff °C
	uncured	uncured	uncured			EGC 100	EGC 100	EGC 100
09:51:56	25.15	25.21	-0.06		08:59:54	24.14	23.24	0.90
09:52:01	25.15	25.15	0.00		08:59:59	24.22	23.31	0.90
09:52:06	25.41	25.15	0.26		09:00:04	24.15	23.31	0.84
09:52:11	26.18	25.15	1.03		09:00:09	24.21	23.30	0.90
09:52:16	27.02	25.08	1.94		09:00:14	24.15	23.31	0.84
09:52:21	27.93	25.03	2.91		09:00:19	24.66	23.24	1.42
09:52:26	28.77	25.03	3.75		09:00:24	25.77	23.25	2.52
09:52:31	29.61	24.96	4.65		09:00:29	26.87	23.25	3.62
09:52:36	30.39	25.03	5.36		09:00:34	27.95	23.24	4.71
09:52:41	31.15	24.95	6.20		09:00:39	29.06	23.25	5.81
09:52:46	31.87	24.90	6.97		09:00:44	29.96	23.24	6.72
09:52:51	32.57	24.89	7.68		09:00:49	30.86	23.30	7.55
09:52:56	33.22	24.89	8.33		09:00:54	31.64	23.25	8.39
09:53:01	33.87	24.89	8.98		09:00:59	32.55	23.32	9.23
09:53:06	34.44	24.82	9.62		09:01:04	33.25	23.24	10.01
09:53:11	35.01	24.81	10.20		09:01:09	34.02	23.30	10.72
09:53:16	35.61	24.89	10.72		09:01:14	34.67	23.24	11.43
09:53:21	36.13	24.83	11.30		09:01:19	35.38	23.24	12.14
09:53:26	36.69	24.81	11.88		09:01:24	35.91	23.31	12.59
09:53:31	37.15	24.82	12.33		09:01:29	36.54	23.30	13.24
09:53:36	37.66	24.81	12.85		09:01:34	37.13	23.25	13.88
09:53:41	38.11	24.74	13.37		09:01:39	37.64	23.24	14.40
09:53:46	38.56	24.74	13.82		09:01:44	38.23	23.25	14.98
09:53:51	39.01	24.81	14.21		09:01:49	38.75	23.25	15.50
09:53:56	39.48	24.75	14.72		09:01:54	39.25	23.24	16.01
09:54:01	39.79	24.68	15.11		09:01:59	39.72	23.25	16.47
09:54:06	40.24	24.74	15.50		09:02:04	40.16	23.24	16.92
09:54:11	40.63	24.68	15.95		09:02:09	40.55	23.30	17.24

Table 9 (continued)

09:54:16	41.02	24.68	16.34	09:02:14	41.00	23.30	17.69
09:54:21	41.40	24.74	16.66	09:02:19	41.46	23.31	18.15
09:54:26	41.73	24.74	16.98	09:02:24	41.85	23.31	18.53
09:54:31	42.10	24.60	17.50	09:02:29	42.23	23.25	18.98
09:54:36	42.44	24.68	17.76	09:02:34	42.62	23.31	19.31
09:54:41	42.81	24.66	18.14	09:02:39	43.00	23.24	19.76
09:54:46	43.08	24.67	18.40	09:02:44	43.33	23.31	20.02
09:54:51	43.45	24.73	18.73	09:02:49	43.71	23.30	20.40
09:54:56	43.78	24.73	19.05	09:02:54	44.04	23.31	20.73
09:55:01	44.03	24.66	19.37	09:02:59	44.43	23.31	21.12
09:55:06	44.37	24.67	19.70	09:03:04	44.68	23.30	21.37
09:55:11	44.69	24.67	20.02	09:03:09	45.01	23.31	21.70
09:55:16	44.94	24.66	20.28	09:03:14	45.32	23.30	22.02
09:55:21	45.20	24.66	20.53	09:03:19	45.65	23.30	22.34
09:55:26	45.51	24.66	20.86	09:03:24	45.97	23.30	22.66
09:55:31	45.76	24.65	21.11	09:03:29	46.23	23.30	22.92
09:55:36	46.02	24.58	21.44	09:03:34	46.50	23.31	23.18
09:55:41	46.28	24.65	21.63	09:03:39	46.75	23.31	23.44
09:55:46	46.61	24.66	21.96	09:03:44	47.14	23.31	23.83
09:55:51	46.80	24.65	22.15	09:03:49	47.34	23.38	23.96
09:55:56	47.05	24.71	22.34	09:03:54	47.66	23.31	24.34
09:56:01	47.31	24.65	22.66	09:03:59	47.92	23.38	24.54
09:56:06	47.57	24.65	22.92	09:04:04	48.11	23.38	24.73
09:56:11	47.76	24.65	23.12	09:04:09	48.36	23.37	24.99
09:56:16	48.01	24.70	23.31	09:04:14	48.69	23.31	25.38
09:56:21	48.21	24.64	23.57	09:04:19	48.89	23.38	25.51
09:56:26	48.47	24.64	23.83	09:04:24	49.07	23.37	25.70
09:56:31	48.65	24.63	24.02	09:04:29	49.33	23.37	25.96
09:56:36	48.86	24.71	24.15	09:04:34	49.59	23.43	26.15
09:56:41	49.10	24.70	24.41	09:04:39	49.85	23.44	26.41
09:56:46	49.30	24.70	24.60	09:04:44	49.98	23.44	26.54
09:56:51	49.49	24.70	24.80	09:04:49	50.23	23.43	26.80
09:56:56	49.68	24.76	24.92	09:04:54	50.44	23.45	26.99
09:57:01	49.89	24.77	25.12	09:04:59	50.69	23.51	27.19
09:57:06	50.06	24.74	25.31	09:05:04	50.89	23.51	27.38
09:57:11	50.34	24.77	25.57	09:05:09	51.08	23.51	27.57
09:57:16	50.45	24.75	25.70	09:05:14	51.27	23.57	27.70
09:57:21	50.70	24.81	25.89	09:05:19	51.47	23.57	27.90
09:57:26	50.90	24.74	26.15	09:05:24	51.66	23.64	28.03
09:57:31	51.02	24.81	26.22	09:05:29	51.92	23.57	28.35
09:57:36	51.28	24.87	26.41	09:05:34	52.11	23.57	28.54
09:57:41	51.35	24.81	26.54	09:05:39	52.23	23.63	28.61
09:57:46	51.61	24.87	26.73	09:05:44	52.43	23.63	28.80
09:57:51	51.81	24.88	26.93	09:05:49	52.55	23.63	28.92
09:57:56	51.94	24.88	27.06	09:05:54	52.81	23.70	29.11

Table 9 (continued)

09:58:01	52.12	24.94	27.18	09:05:59	53.00	23.70	29.30
09:58:06	52.25	24.94	27.31	09:06:04	53.13	23.70	29.43
09:58:11	52.44	24.94	27.51	09:06:09	53.25	23.77	29.49
09:58:16	52.62	24.99	27.63	09:06:14	53.49	23.76	29.74
09:58:21	52.74	24.99	27.76	09:06:19	53.63	23.83	29.80
09:58:26	52.87	24.99	27.88	09:06:24	53.76	23.83	29.92
09:58:31	53.07	25.00	28.07	09:06:29	54.01	23.90	30.11
09:58:36	53.19	25.06	28.13	09:06:34	54.13	23.90	30.24
09:58:41	53.38	25.06	28.32	09:06:39	54.26	23.90	30.36
09:58:46	53.51	25.12	28.38	09:06:44	54.38	23.90	30.49
09:58:51	53.62	25.11	28.51	09:06:49	54.56	23.95	30.61
09:58:56	53.81	25.11	28.70	09:06:54	54.70	24.02	30.67
09:59:01	53.94	25.18	28.76	09:06:59	54.82	24.02	30.80
09:59:06	54.06	25.18	28.88	09:07:04	54.99	24.00	30.99
09:59:11	54.26	25.25	29.01	09:07:09	55.13	24.08	31.05
09:59:16	54.39	25.25	29.13	09:07:14	55.32	24.08	31.24
09:59:21	54.50	25.31	29.19	09:07:19	55.38	24.14	31.24
09:59:26	54.61	25.36	29.25	09:07:24	55.57	24.21	31.36
09:59:31	54.75	25.37	29.38	09:07:29	55.77	24.22	31.55
09:59:36	54.94	25.37	29.57	09:07:34	55.83	24.22	31.61
09:59:41	55.06	25.50	29.57	09:07:39	56.02	24.22	31.80
09:59:46	55.18	25.42	29.76	09:07:44	56.08	24.28	31.80
09:59:51	55.24	25.49	29.75	09:07:49	56.20	24.27	31.92
09:59:56	55.37	25.49	29.88	09:07:54	56.39	24.41	31.98
10:00:01	55.55	25.55	30.00	09:07:59	56.51	24.40	32.11
10:00:06	55.68	25.55	30.13	09:08:04	56.64	24.40	32.23
10:00:11	55.74	25.61	30.13	09:08:09	56.83	24.48	32.36
10:00:16	55.94	25.69	30.25	09:08:14	56.83	24.48	32.36
10:00:21	56.00	25.56	30.44	09:08:19	57.02	24.54	32.48
10:00:26	56.13	25.69	30.44	09:08:24	57.15	24.54	32.61
10:00:31	56.24	25.68	30.57	09:08:29	57.27	24.54	32.73
10:00:36	56.38	25.75	30.63	09:08:34	57.34	24.67	32.67
10:00:41	56.51	25.75	30.75	09:08:39	57.46	24.67	32.79
10:00:46	56.63	25.82	30.81	09:08:44	57.59	24.67	32.92
10:00:51	56.70	25.82	30.88	09:08:49	57.78	24.80	32.98
10:00:56	56.81	25.87	30.94	09:08:54	57.84	24.80	33.04
10:01:01	56.94	25.94	31.00	09:08:59	57.90	24.80	33.10
10:01:06	56.99	25.93	31.06	09:09:04	58.03	24.86	33.16
10:01:11	57.18	25.93	31.25	09:09:09	58.14	24.85	33.29
10:01:16	57.23	25.92	31.31	09:09:14	58.28	24.93	33.35
10:01:21	57.36	25.99	31.37	09:09:19	58.41	24.93	33.48
10:01:26	57.50	26.12	31.37	09:09:24	58.52	25.05	33.47
10:01:31	57.55	26.12	31.43	09:09:29	58.66	25.06	33.60
10:01:36	57.67	26.18	31.49	09:09:34	58.72	25.12	33.60
10:01:41	57.81	26.19	31.62	09:09:39	58.78	25.19	33.60

Table 9 (continued)

10:01:46	57.87	26.25	31.62	09:09:44	58.96	25.18	33.78
10:01:51	58.00	26.25	31.74	09:09:49	59.02	25.24	33.78
10:01:56	58.11	26.24	31.87	09:09:54	59.16	25.32	33.84
10:02:01	58.18	26.31	31.87	09:09:59	59.22	25.32	33.91
10:02:06	58.25	26.38	31.87	09:10:04	59.35	25.32	34.03
10:02:11	58.37	26.37	31.99	09:10:09	59.41	25.38	34.03
10:02:16	58.50	26.45	32.05	09:10:14	59.54	25.38	34.16
10:02:21	58.55	26.50	32.05	09:10:19	59.60	25.45	34.15
10:02:26	58.69	26.51	32.18	09:10:24	59.78	25.50	34.28
10:02:31	58.74	26.63	32.11	09:10:29	59.84	25.56	34.28
10:02:36	58.85	26.62	32.24	09:10:34	59.90	25.56	34.34
10:02:41	58.91	26.62	32.30	09:10:39	60.06	25.59	34.46
10:02:46	59.05	26.69	32.36	09:10:44	60.11	25.65	34.46
10:02:51	59.18	26.69	32.49	09:10:49	60.23	25.71	34.52
10:02:56	59.18	26.75	32.42	09:10:54	60.30	25.71	34.59
10:03:01	59.35	26.81	32.55	09:10:59	60.42	25.77	34.65
10:03:06	59.42	26.81	32.61	09:11:04	60.48	25.84	34.65
10:03:11	59.49	26.88	32.61	09:11:09	60.56	25.85	34.71
10:03:16	59.62	26.95	32.67	09:11:14	60.68	25.98	34.71
10:03:21	59.68	26.95	32.73	09:11:19	60.74	25.97	34.77
10:03:26	59.73	27.00	32.73	09:11:24	60.89	26.06	34.83
10:03:31	59.81	27.08	32.73	09:11:29	60.94	26.05	34.89
10:03:36	59.92	27.07	32.85	09:11:34	61.01	26.06	34.95
10:03:41	60.06	27.08	32.98	09:11:39	61.13	26.11	35.02
10:03:46	60.11	27.13	32.98	09:11:44	61.19	26.11	35.08
10:03:51	60.17	27.13	33.04	09:11:49	61.32	26.24	35.07
10:03:56	60.23	27.20	33.04	09:11:54	61.34	26.27	35.07
10:04:01	60.28	27.31	32.97	09:11:59	61.45	26.32	35.14
10:04:06	60.42	27.38	33.03	09:12:04	61.52	26.39	35.13
10:04:11	60.47	27.37	33.10	09:12:09	61.60	26.40	35.20
10:04:16	60.61	27.38	33.22	09:12:14	61.72	26.46	35.26
10:04:21	60.60	27.37	33.22	09:12:19	61.85	26.53	35.32
10:04:26	60.72	27.44	33.28	09:12:24	61.84	26.52	35.32
10:04:31	60.79	27.58	33.22	09:12:29	61.98	26.60	35.38
10:04:36	60.91	27.57	33.34	09:12:34	62.11	26.67	35.44
10:04:41	61.04	27.63	33.40	09:12:39	62.18	26.67	35.50
10:04:46	61.05	27.64	33.40	09:12:44	62.24	26.74	35.50
10:04:51	61.16	27.63	33.53	09:12:49	62.23	26.73	35.50
10:04:56	61.22	27.70	33.53	09:12:54	62.43	26.87	35.56
10:05:01	61.29	27.70	33.59	09:12:59	62.43	26.87	35.56
10:05:06	61.33	27.81	33.52	09:13:04	62.55	26.93	35.62
10:05:11	61.41	27.89	33.52	09:13:09	62.56	27.00	35.56
10:05:16	61.52	27.87	33.65	09:13:14	62.70	27.01	35.68
10:05:21	61.52	27.87	33.65	09:13:19	62.74	27.06	35.68
10:05:26	61.66	27.95	33.71	09:13:24	62.82	27.08	35.74

Table 9 (continued)

10:05:31	61.72	28.01	33.71	09:13:29	62.87	27.13	35.74
10:05:36	61.85	28.08	33.77	09:13:34	63.00	27.13	35.87
10:05:41	61.90	28.07	33.83	09:13:39	63.06	27.26	35.80
10:05:46	61.96	28.20	33.77	09:13:44	63.12	27.26	35.86
10:05:51	61.97	28.21	33.77	09:13:49	63.20	27.27	35.93
10:05:56	62.09	28.20	33.89	09:13:54	63.20	27.33	35.86
10:06:01	62.16	28.27	33.89	09:13:59	63.32	27.40	35.92
10:06:06	62.29	28.27	34.02	09:14:04	63.39	27.40	35.99
10:06:11	62.32	28.31	34.01	09:14:09	63.45	27.53	35.92
10:06:16	62.32	28.37	33.95	09:14:14	63.50	27.52	35.98
10:06:21	62.46	28.26	34.20	09:14:19	63.63	27.52	36.11
10:06:26	62.46	28.32	34.14	09:14:24	63.64	27.53	36.11
10:06:31	62.57	28.50	34.07	09:14:29	63.78	27.67	36.11
10:06:36	62.65	28.51	34.13	09:14:34	63.78	27.67	36.11
10:06:41	62.70	28.57	34.13	09:14:39	63.90	27.74	36.17
10:06:46	62.77	28.64	34.13	09:14:44	63.97	27.80	36.16
10:06:51	62.83	28.63	34.19	09:14:49	64.03	27.80	36.23
10:06:56	62.81	28.68	34.13	09:14:54	64.08	27.86	36.22
10:07:01	62.95	28.76	34.19	09:14:59	64.16	27.93	36.22
10:07:06	63.03	28.84	34.19	09:15:04	64.28	28.00	36.29
10:07:11	63.14	28.76	34.38	09:15:09	64.30	27.95	36.35
10:07:16	63.20	28.88	34.31	09:15:14	64.36	28.08	36.28
10:07:21	63.20	28.88	34.31	09:15:19	64.41	28.13	36.28
10:07:26	63.25	28.94	34.31	09:15:24	64.54	28.13	36.41
10:07:31	63.31	28.94	34.37	09:15:29	64.55	28.14	36.41
10:07:36	63.36	28.99	34.37	09:15:34	64.67	28.27	36.40
10:07:41	63.50	29.06	34.43	09:15:39	64.73	28.26	36.47
10:07:46	63.50	29.06	34.43	09:15:44	64.74	28.34	36.40
10:07:51	63.55	29.12	34.43	09:15:49	64.79	28.39	36.40
10:07:56	63.61	29.18	34.43	09:15:54	64.85	28.39	36.46
10:08:01	63.66	29.16	34.49	09:15:59	64.92	28.46	36.46
10:08:06	63.72	29.23	34.49	09:16:04	64.98	28.39	36.59
10:08:11	63.85	29.23	34.62	09:16:09	65.05	28.53	36.52
10:08:16	63.86	29.30	34.55	09:16:14	65.11	28.59	36.52
10:08:21	63.91	29.42	34.49	09:16:19	65.18	28.66	36.52
10:08:26	63.98	29.30	34.68	09:16:24	65.24	28.66	36.58
10:08:31	64.03	29.42	34.61	09:16:29	65.29	28.71	36.58
10:08:36	64.11	29.50	34.61	09:16:34	65.36	28.71	36.64
10:08:41	64.17	29.56	34.61	09:16:39	65.43	28.86	36.57
10:08:46	64.22	29.55	34.67	09:16:44	65.50	28.86	36.64
10:08:51	64.28	29.55	34.74	09:16:49	65.51	28.87	36.64
10:08:56	64.33	29.60	34.73	09:16:54	65.62	28.92	36.70
10:09:01	64.40	29.67	34.73	09:16:59	65.69	28.99	36.70
10:09:06	64.47	29.74	34.73	09:17:04	65.75	29.05	36.70
10:09:11	64.45	29.79	34.67	09:17:09	65.82	29.06	36.76

Table 9 (continued)

10:09:16	64.58	29.85	34.73	09:17:14	65.88	29.13	36.76
10:09:21	64.57	29.91	34.66	09:17:19	65.87	29.18	36.69
10:09:26	64.63	29.91	34.72	09:17:24	66.01	29.19	36.82
10:09:31	64.69	29.97	34.72	09:17:29	66.06	29.25	36.82
10:09:36	64.77	30.05	34.72	09:17:34	66.00	29.31	36.69
10:09:41	64.82	30.04	34.78	09:17:39	66.13	29.25	36.88
10:09:46	64.87	30.08	34.78	09:17:44	66.20	29.39	36.81
10:09:51	64.93	30.15	34.78	09:17:49	66.19	29.31	36.88
10:09:56	65.01	30.17	34.84	09:17:54	66.26	29.45	36.81
10:10:01	65.06	30.15	34.91	09:17:59	66.32	29.45	36.87
10:10:06	65.06	30.21	34.84	09:18:04	66.39	29.51	36.87
10:10:11	65.12	30.21	34.90	09:18:09	66.47	29.60	36.87
10:10:16	65.19	30.35	34.84	09:18:14	66.50	29.63	36.87
10:10:21	65.18	30.28	34.90	09:18:19	66.57	29.70	36.87
10:10:26	65.31	30.34	34.96	09:18:24	66.65	29.79	36.87
10:10:31	65.32	30.35	34.97	09:18:29	66.71	29.78	36.93
10:10:36	65.37	30.41	34.96	09:18:34	66.78	29.85	36.93
10:10:41	65.44	30.42	35.03	09:18:39	66.78	29.85	36.93
10:10:46	65.51	30.48	35.02	09:18:44	66.84	29.92	36.92
10:10:51	65.57	30.55	35.02	09:18:49	66.90	29.91	36.99
10:10:56	65.62	30.60	35.02	09:18:54	66.90	29.84	37.05
10:11:01	65.63	30.61	35.02	09:18:59	66.97	29.98	36.99
10:11:06	65.69	30.61	35.08	09:19:04	67.02	30.04	36.98
10:11:11	65.73	30.65	35.08	09:19:09	67.08	30.10	36.98
10:11:16	65.81	30.60	35.21	09:19:14	67.09	30.11	36.98
10:11:21	65.87	30.73	35.14	09:19:19	67.22	30.11	37.11
10:11:26	65.87	30.79	35.08	09:19:24	67.21	30.30	36.91
10:11:31	65.94	30.73	35.21	09:19:29	67.28	30.31	36.98
10:11:36	66.01	30.87	35.14	09:19:34	67.35	30.24	37.10
10:11:41	66.07	30.87	35.20	09:19:39	67.41	30.18	37.23
10:11:46	66.13	30.93	35.20	09:19:44	67.49	30.39	37.10
10:11:51	66.19	30.99	35.20	09:19:49	67.54	30.44	37.10
10:11:56	66.26	31.06	35.20	09:19:54	67.61	30.45	37.16
10:12:01	66.25	31.05	35.20	09:19:59	67.60	30.44	37.16
10:12:06	66.32	31.06	35.26	09:20:04	67.67	30.44	37.22
10:12:11	66.38	31.12	35.26	09:20:09	67.73	30.51	37.22
10:12:16	66.44	31.25	35.19	09:20:14	67.73	30.57	37.16
10:12:21	66.44	31.18	35.26	09:20:19	67.79	30.70	37.09
10:12:26	66.50	31.18	35.32	09:20:24	67.85	30.70	37.15
10:12:31	66.50	31.38	35.12	09:20:29	67.85	30.64	37.22
10:12:36	66.61	31.29	35.32	09:20:34	67.92	30.64	37.28
10:12:41	66.62	31.37	35.25	09:20:39	67.99	30.84	37.15
10:12:46	66.69	31.44	35.25	09:20:44	67.98	30.76	37.21
10:12:51	66.75	31.50	35.25	09:20:49	68.10	30.89	37.21
10:12:56	66.75	31.51	35.25	09:20:54	68.12	30.90	37.21

Table 9 (continued)

10:13:01	66.88	31.44	35.44	09:20:59	68.10	30.96	37.15
10:13:06	66.95	31.52	35.44	09:21:04	68.17	30.96	37.21
10:13:11	66.87	31.56	35.31	09:21:09	68.26	31.05	37.21
10:13:16	66.95	31.64	35.31	09:21:14	68.25	31.04	37.21
10:13:21	67.01	31.71	35.31	09:21:19	68.29	31.02	37.27
10:13:26	67.07	31.63	35.43	09:21:24	68.36	30.96	37.40
10:13:31	67.13	31.63	35.49	09:21:29	68.42	31.09	37.33
10:13:36	67.13	31.57	35.56	09:21:34	68.42	31.15	37.27
10:13:41	67.20	31.71	35.49	09:21:39	68.48	31.09	37.39
10:13:46	67.20	31.77	35.43	09:21:44	68.56	31.23	37.33
10:13:51	67.27	31.84	35.43	09:21:49	68.56	31.17	37.39
10:13:56	67.31	31.82	35.49	09:21:54	68.62	31.23	37.39
10:14:01	67.36	31.88	35.49	09:21:59	68.63	31.31	37.33
10:14:06	67.38	31.89	35.49	09:22:04	68.75	31.23	37.52
10:14:11	67.52	31.97	35.55	09:22:09	68.76	31.37	37.39
10:14:16	67.50	31.95	35.55	09:22:14	68.82	31.37	37.45
10:14:21	67.56	32.02	35.55	09:22:19	68.89	31.50	37.38
10:14:26	67.58	32.10	35.48	09:22:24	68.87	31.49	37.38
10:14:31	67.63	32.08	35.55	09:22:29	68.87	31.43	37.45
10:14:36	67.63	32.08	35.55	09:22:34	69.00	31.49	37.51
10:14:41	67.69	32.14	35.55	09:22:39	69.06	31.56	37.51
10:14:46	67.74	32.13	35.61	09:22:44	69.06	31.62	37.44
10:14:51	67.80	32.13	35.67	09:22:49	69.15	31.65	37.51
10:14:56	67.87	32.26	35.60	09:22:54	69.14	31.70	37.44
10:15:01	67.88	32.34	35.54	09:22:59	69.20	31.70	37.50
10:15:06	67.94	32.27	35.67	09:23:04	69.26	31.76	37.50
10:15:11	67.91	32.25	35.67	09:23:09	69.26	31.69	37.57
10:15:16	67.99	32.32	35.67	09:23:14	69.28	31.84	37.44
10:15:21	68.05	32.32	35.73	09:23:19	69.40	31.84	37.56
10:15:26	68.05	32.45	35.60	09:23:24	69.39	31.77	37.63
10:15:31	68.04	32.44	35.60	09:23:29	69.47	31.90	37.56
10:15:36	68.11	32.45	35.66	09:23:34	69.47	31.90	37.56
10:15:41	68.18	32.39	35.79	09:23:39	69.52	32.09	37.43
10:15:46	68.24	32.52	35.72	09:23:44	69.52	32.02	37.50
10:15:51	68.23	32.51	35.72	09:23:49	69.58	32.02	37.56
10:15:56	68.29	32.51	35.79	09:23:54	69.66	32.03	37.62
10:16:01	68.29	32.57	35.72	09:23:59	69.66	32.10	37.56
10:16:06	68.35	32.57	35.78	09:24:04	69.66	32.16	37.49
10:16:11	68.40	32.68	35.72	09:24:09	69.72	32.16	37.56
10:16:16	68.43	32.71	35.72	09:24:14	69.78	32.23	37.55
10:16:21	68.49	32.77	35.72	09:24:19	69.84	32.16	37.68
10:16:26	68.47	32.56	35.91	09:24:24	69.84	32.29	37.55
10:16:31	68.54	32.76	35.78	09:24:29	69.92	32.37	37.55
10:16:36	68.60	32.82	35.78	09:24:34	69.91	32.36	37.55
10:16:41	68.53	32.81	35.71	09:24:39	70.04	32.36	37.67

Table 9 (continued)

10:16:46	68.60	32.82	35.78	09:24:44	70.05	32.37	37.68
10:16:51	68.66	32.76	35.91	09:24:49	70.10	32.43	37.67
10:16:56	68.73	32.69	36.03	09:24:54	70.04	32.56	37.48
10:17:01	68.79	32.89	35.90	09:24:59	70.10	32.49	37.61
10:17:06	68.79	32.95	35.84	09:25:04	70.11	32.50	37.61
10:17:11	68.78	33.07	35.71	09:25:09	70.23	32.62	37.60
10:17:16	68.84	33.07	35.77	09:25:14	70.23	32.56	37.67
10:17:21	68.90	33.01	35.90	09:25:19	70.30	32.70	37.60
10:17:26	68.97	33.13	35.83	09:25:24	70.35	32.75	37.60
10:17:31	68.98	33.14	35.83	09:25:29	70.35	32.75	37.60
10:17:36	69.02	33.13	35.90	09:25:34	70.36	32.89	37.47
10:17:41	69.02	33.13	35.90	09:25:39	70.50	32.78	37.73
10:17:46	69.09	33.26	35.83	09:25:44	70.43	32.76	37.67
10:17:51	69.14	33.25	35.89	09:25:49	70.48	32.88	37.60
10:17:56	69.14	33.31	35.83	09:25:54	70.48	32.81	37.66
10:18:01	69.21	33.32	35.89	09:25:59	70.54	32.75	37.79
10:18:06	69.20	33.31	35.89	09:26:04	70.60	32.81	37.79
10:18:11	69.26	33.38	35.89	09:26:09	70.67	32.88	37.79
10:18:16	69.33	33.31	36.02	09:26:14	70.68	32.96	37.72
10:18:21	69.34	33.39	35.95	09:26:19	70.74	33.03	37.72
10:18:26	69.34	33.45	35.89	09:26:24	70.76	33.10	37.66
10:18:31	69.39	33.57	35.82	09:26:29	70.81	33.03	37.78
10:18:36	69.40	33.52	35.89	09:26:34	70.88	33.16	37.72
10:18:41	69.45	33.51	35.95	09:26:39	70.87	33.15	37.72
10:18:46	69.46	33.39	36.08	09:26:44	70.88	33.23	37.65
10:18:51	69.52	33.57	35.95	09:26:49	70.93	33.28	37.65
10:18:56	69.57	33.63	35.95	09:26:54	70.94	33.29	37.65
10:19:01	69.58	33.64	35.94	09:26:59	70.93	33.28	37.65
10:19:06	69.57	33.76	35.82	09:27:04	71.06	33.41	37.65
10:19:11	69.64	33.63	36.01	09:27:09	71.06	33.41	37.65
10:19:16	69.69	33.68	36.01	09:27:14	71.06	33.41	37.65
10:19:21	69.69	33.68	36.01	09:27:19	71.12	33.35	37.77
10:19:26	69.76	33.82	35.94	09:27:24	71.12	33.41	37.71
10:19:31	69.76	33.76	36.00	09:27:29	71.18	33.41	37.77
10:19:36	69.83	33.82	36.00	09:27:34	71.18	33.48	37.71
10:19:41	69.83	33.89	35.94	09:27:39	71.26	33.49	37.77
10:19:46	69.89	33.89	36.00	09:27:44	71.33	33.56	37.77
10:19:51	69.88	33.94	35.94	09:27:49	71.34	33.63	37.70
10:19:56	69.95	33.82	36.13	09:27:54	71.32	33.55	37.77
10:20:01	69.94	34.01	35.93	09:27:59	71.40	33.70	37.70
10:20:06	70.00	33.94	36.06	09:28:04	71.37	33.67	37.70
10:20:11	70.01	34.02	36.00	09:28:09	71.44	33.67	37.77
10:20:16	70.08	34.08	36.00	09:28:14	71.53	33.76	37.76
10:20:21	70.14	34.08	36.06	09:28:19	71.50	33.67	37.83
10:20:26	70.13	34.14	35.99	09:28:24	71.57	33.75	37.83

Table 9 (continued)

10:20:31	70.14	34.15	35.99	09:28:29	71.56	33.80	37.76
10:20:36	70.20	34.15	36.06	09:28:34	71.62	33.86	37.76
10:20:41	70.19	34.20	35.99	09:28:39	71.64	33.88	37.76
10:20:46	70.19	34.26	35.93	09:28:44	71.64	33.81	37.83
10:20:51	70.25	34.20	36.05	09:28:49	71.70	33.82	37.89
10:20:56	70.33	34.27	36.05	09:28:54	71.78	33.95	37.83
10:21:01	70.33	34.40	35.92	09:28:59	71.77	34.01	37.76
10:21:06	70.39	34.34	36.05	09:29:04	71.78	34.08	37.69
10:21:11	70.38	34.19	36.18	09:29:09	71.84	34.02	37.82
10:21:16	70.38	34.32	36.05	09:29:14	71.90	34.15	37.75
10:21:21	70.44	34.26	36.18	09:29:19	71.95	34.14	37.82
10:21:26	70.50	34.32	36.18	09:29:24	71.95	34.14	37.82
10:21:31	70.58	34.40	36.18	09:29:29	71.95	34.27	37.69
10:21:36	70.50	34.39	36.11	09:29:34	72.03	34.28	37.75
10:21:41	70.55	34.51	36.05	09:29:39	72.03	34.21	37.81
10:21:46	70.62	34.51	36.11	09:29:44	72.08	34.14	37.94
10:21:51	70.63	34.45	36.17	09:29:49	72.09	34.28	37.81
10:21:56	70.69	34.39	36.30	09:29:54	72.13	34.38	37.75
10:22:01	70.69	34.45	36.24	09:29:59	72.15	34.28	37.88
10:22:06	70.68	34.44	36.24	09:30:04	72.22	34.34	37.87
10:22:11	70.69	34.45	36.24	09:30:09	72.22	34.34	37.87
10:22:16	70.75	34.58	36.17	09:30:14	72.21	34.40	37.81
10:22:21	70.75	34.65	36.11	09:30:19	72.27	34.46	37.81
10:22:26	70.80	34.70	36.10	09:30:24	72.28	34.47	37.81
10:22:31	70.88	34.71	36.17	09:30:29	72.34	34.41	37.94
10:22:36	70.88	34.77	36.10	09:30:34	72.34	34.54	37.81
10:22:41	70.94	34.84	36.10	09:30:39	72.34	34.41	37.94
10:22:46	70.93	34.76	36.16	09:30:44	72.41	34.67	37.74
10:22:51	70.93	34.83	36.10	09:30:49	72.47	34.54	37.93
10:22:56	70.94	34.90	36.04	09:30:54	72.46	34.53	37.93
10:23:01	71.00	34.84	36.16	09:30:59	72.47	34.54	37.93
10:23:06	71.00	34.90	36.10	09:31:04	72.53	34.60	37.93
10:23:11	71.06	34.96	36.10	09:31:09	72.52	34.72	37.80
10:23:16	71.13	34.90	36.23	09:31:14	72.58	34.66	37.93
10:23:21	71.13	34.84	36.29	09:31:19	72.66	34.79	37.86
10:23:26	71.12	34.89	36.22	09:31:24	72.66	34.79	37.86
10:23:31	71.25	34.97	36.29	09:31:29	72.71	34.72	37.99
10:23:36	71.18	34.96	36.22	09:31:34	72.65	34.78	37.86
10:23:41	71.24	34.96	36.29	09:31:39	72.71	34.72	37.99
10:23:46	71.25	35.03	36.22	09:31:44	72.77	34.78	37.99
10:23:51	71.24	34.96	36.29	09:31:49	72.83	34.91	37.92
10:23:56	71.25	35.03	36.22	09:31:54	72.83	34.98	37.86
10:24:01	71.38	35.10	36.28	09:31:59	72.85	34.99	37.86
10:24:06	71.38	35.23	36.15	09:32:04	72.90	34.98	37.92
10:24:11	71.38	35.23	36.15	09:32:09	72.90	34.91	37.98

Table 9 (continued)

10:24:16	71.38	35.16	36.22	09:32:14	72.90	35.04	37.85
10:24:21	71.43	35.15	36.28	09:32:19	72.96	34.98	37.98
10:24:26	71.43	35.22	36.22	09:32:24	72.96	34.91	38.05
10:24:31	71.43	35.22	36.22	09:32:29	73.02	35.04	37.98
10:24:36	71.50	35.28	36.21	09:32:34	73.03	35.18	37.85
10:24:41	71.56	35.35	36.21	09:32:39	73.09	35.11	37.98
10:24:46	71.57	35.42	36.15	09:32:44	73.10	35.05	38.04
10:24:51	71.63	35.42	36.21	09:32:49	73.10	35.18	37.91
10:24:56	71.62	35.41	36.21	09:32:54	73.15	35.24	37.91
10:25:01	71.68	35.35	36.34	09:32:59	73.15	35.24	37.91
10:25:06	71.69	35.49	36.21	09:33:04	73.15	35.24	37.91
10:25:11	71.68	35.48	36.21	09:33:09	73.15	35.24	37.91
10:25:16	71.76	35.49	36.27	09:33:14	73.21	35.24	37.97
10:25:21	71.76	35.42	36.34	09:33:19	73.27	35.11	38.17
10:25:26	71.82	35.55	36.27	09:33:24	73.27	35.17	38.10
10:25:31	71.82	35.55	36.27	09:33:29	73.34	35.30	38.04
10:25:36	71.82	35.55	36.27	09:33:34	73.34	35.24	38.10
10:25:41	71.82	35.49	36.34	09:33:39	73.34	35.30	38.04
10:25:46	71.87	35.54	36.33				
10:25:51	71.88	35.61	36.27				

Table 10: Test Data for 200°C and 250°C Cured Epoxy/Glass Composite (Through Layers)

Time	Ch 2	Ch 3	Temp	Time	Ch 2	Ch 3	Temp
	Bottom	Top	Diff °C		Bottom	Top	Diff °C
	EGC 200	EGC 200	EGC 200		EGC 250	EGC 250	EGC 250
08:05:36	23.16	23.41	-0.26	10:22:56	27.12	21.96	5.17
08:05:42	23.16	23.41	-0.26	10:23:02	27.12	21.96	5.17
08:05:46	23.16	23.41	-0.26	10:23:06	27.83	22.02	5.81
08:05:51	23.48	23.41	0.06	10:23:11	28.61	21.96	6.65
08:05:56	24.25	23.41	0.84	10:23:16	29.45	21.96	7.49
08:06:01	25.21	23.40	1.81	10:23:21	30.22	22.02	8.20
08:06:06	26.10	23.39	2.71	10:23:26	30.93	22.02	8.91
08:06:11	27.01	23.40	3.62	10:23:31	31.58	22.02	9.56
08:06:16	27.92	23.33	4.58	10:23:36	32.29	22.09	10.20
08:06:21	28.68	23.38	5.29	10:23:41	32.92	22.00	10.91
08:06:26	29.53	23.40	6.13	10:23:46	33.56	22.13	11.43
08:06:31	30.23	23.39	6.84	10:23:51	34.14	22.07	12.08
08:06:36	31.00	23.38	7.62	10:23:56	34.73	22.07	12.66
08:06:41	31.65	23.38	8.27	10:24:01	35.24	22.13	13.11
08:06:46	32.36	23.32	9.04	10:24:06	35.76	22.13	13.63
08:06:51	32.94	23.32	9.62	10:24:11	36.21	22.13	14.08
08:06:56	33.52	23.32	10.20	10:24:16	36.79	22.13	14.66
08:07:01	34.08	23.30	10.78	10:24:21	37.24	22.13	15.11
08:07:06	34.60	23.30	11.30	10:24:26	37.70	22.13	15.56
08:07:11	35.12	23.30	11.82	10:24:31	38.15	22.20	15.95
08:07:16	35.70	23.37	12.33	10:24:36	38.60	22.20	16.40
08:07:21	36.15	23.30	12.85	10:24:41	38.98	22.19	16.79
08:07:26	36.59	23.28	13.30	10:24:46	39.44	22.20	17.24
08:07:31	37.05	23.30	13.75	10:24:51	39.83	22.20	17.63
08:07:36	37.51	23.30	14.21	10:24:56	40.21	22.26	17.95
08:07:41	37.94	23.28	14.66	10:25:01	40.60	22.33	18.27
08:07:46	38.33	23.28	15.05	10:25:06	40.91	22.25	18.66
08:07:51	38.78	23.28	15.50	10:25:11	41.31	22.33	18.98
08:07:56	39.17	23.28	15.88	10:25:16	41.64	22.33	19.31
08:08:01	39.56	23.28	16.27	10:25:21	41.96	22.33	19.63
08:08:06	39.93	23.20	16.72	10:25:26	42.35	22.33	20.02
08:08:11	40.25	23.20	17.05	10:25:31	42.67	22.33	20.34
08:08:16	40.64	23.27	17.37	10:25:36	42.93	22.39	20.53
08:08:21	40.96	23.20	17.76	10:25:41	43.25	22.46	20.79
08:08:26	41.28	23.27	18.02	10:25:46	43.62	22.38	21.24
08:08:31	41.61	23.20	18.40	10:25:51	43.90	22.39	21.50
08:08:36	41.98	23.19	18.79	10:25:56	44.14	22.44	21.70
08:08:41	42.32	23.20	19.11	10:26:01	44.46	22.44	22.02
08:08:46	42.56	23.25	19.31	10:26:06	44.73	22.46	22.28
08:08:51	42.88	23.25	19.63	10:26:11	44.98	22.51	22.47
08:08:56	43.14	23.25	19.89	10:26:16	45.24	22.51	22.73

Table 10 (continued)

08:09:01	43.45	23.24	20.21	10:26:21	45.56	22.44	23.12
08:09:06	43.77	23.24	20.53	10:26:26	45.75	22.51	23.25
08:09:11	43.96	23.24	20.73	10:26:31	46.01	22.57	23.44
08:09:16	44.29	23.17	21.11	10:26:36	46.27	22.57	23.70
08:09:21	44.54	23.24	21.31	10:26:41	46.53	22.57	23.96
08:09:26	44.80	23.24	21.57	10:26:46	46.72	22.63	24.09
08:09:31	45.11	23.23	21.89	10:26:51	47.04	22.63	24.41
08:09:36	45.24	23.22	22.02	10:26:56	47.24	22.63	24.60
08:09:41	45.63	23.22	22.41	10:27:01	47.50	22.63	24.86
08:09:46	45.75	23.22	22.54	10:27:06	47.69	22.63	25.05
08:09:51	46.08	23.22	22.86	10:27:11	47.94	22.69	25.25
08:09:56	46.27	23.22	23.05	10:27:16	48.21	22.70	25.51
08:10:01	46.45	23.27	23.18	10:27:21	48.40	22.76	25.64
08:10:06	46.71	23.20	23.50	10:27:26	48.59	22.76	25.83
08:10:11	46.97	23.20	23.76	10:27:31	48.85	22.76	26.09
08:10:16	47.16	23.27	23.89	10:27:36	49.05	22.83	26.22
08:10:21	47.35	23.27	24.09	10:27:41	49.30	22.83	26.48
08:10:26	47.61	23.27	24.34	10:27:46	49.43	22.89	26.54
08:10:31	47.79	23.25	24.54	10:27:51	49.63	22.89	26.73
08:10:36	47.98	23.32	24.67	10:27:56	49.88	22.89	26.99
08:10:41	48.18	23.25	24.92	10:28:01	50.08	22.89	27.19
08:10:46	48.37	23.25	25.12	10:28:06	50.21	22.89	27.31
08:10:51	48.63	23.32	25.31	10:28:11	50.47	22.96	27.51
08:10:56	48.81	23.36	25.44	10:28:16	50.59	22.96	27.64
08:11:01	49.00	23.36	25.64	10:28:21	50.78	23.01	27.77
08:11:06	49.13	23.36	25.76	10:28:26	50.98	23.02	27.96
08:11:11	49.37	23.35	26.02	10:28:31	51.18	23.02	28.15
08:11:16	49.50	23.41	26.09	10:28:36	51.31	23.09	28.22
08:11:21	49.69	23.41	26.28	10:28:41	51.56	23.09	28.48
08:11:26	49.89	23.41	26.47	10:28:46	51.69	23.15	28.54
08:11:31	50.08	23.41	26.67	10:28:51	51.89	23.15	28.74
08:11:36	50.19	23.46	26.73	10:28:56	52.07	23.21	28.86
08:11:41	50.39	23.46	26.93	10:29:01	52.21	23.22	28.99
08:11:46	50.63	23.44	27.18	10:29:06	52.39	23.27	29.12
08:11:51	50.69	23.51	27.18	10:29:11	52.53	23.28	29.25
08:11:56	50.89	23.51	27.38	10:29:16	52.65	23.34	29.31
08:12:01	51.02	23.51	27.51	10:29:21	52.84	23.41	29.43
08:12:06	51.21	23.57	27.64	10:29:26	52.97	23.41	29.56
08:12:11	51.32	23.56	27.77	10:29:31	53.16	23.47	29.68
08:12:16	51.52	23.56	27.96	10:29:36	53.28	23.54	29.74
08:12:21	51.71	23.56	28.15	10:29:41	53.41	23.54	29.87
08:12:26	51.84	23.69	28.15	10:29:46	53.53	23.60	29.93
08:12:31	52.02	23.60	28.41	10:29:51	53.66	23.60	30.06
08:12:36	52.15	23.67	28.48	10:29:56	53.85	23.60	30.25
08:12:41	52.27	23.67	28.61	10:30:01	53.97	23.67	30.31

Table 10 (continued)

08:12:46	52.40	23.73	28.67	10:30:06	54.09	23.66	30.43
08:12:51	52.58	23.78	28.79	10:30:11	54.23	23.73	30.49
08:12:56	52.70	23.78	28.92	10:30:16	54.41	23.80	30.62
08:13:01	52.83	23.85	28.98	10:30:21	54.48	23.86	30.62
08:13:06	53.02	23.85	29.17	10:30:26	54.66	23.93	30.74
08:13:11	53.13	23.83	29.30	10:30:31	54.78	23.85	30.93
08:13:16	53.25	23.83	29.42	10:30:36	54.91	23.98	30.93
08:13:21	53.36	23.88	29.48	10:30:41	55.04	24.05	30.99
08:13:26	53.49	23.88	29.61	10:30:46	55.10	24.05	31.05
08:13:31	53.61	23.94	29.67	10:30:51	55.21	24.04	31.18
08:13:36	53.72	23.93	29.80	10:30:56	55.34	24.10	31.24
08:13:41	53.85	23.99	29.86	10:31:01	55.48	24.18	31.30
08:13:46	54.04	23.99	30.05	10:31:06	55.59	24.17	31.42
08:13:51	54.16	24.06	30.11	10:31:11	55.72	24.23	31.49
08:13:56	54.21	24.10	30.11	10:31:16	55.84	24.23	31.61
08:14:01	54.40	24.10	30.29	10:31:21	55.97	24.30	31.67
08:14:06	54.52	24.17	30.35	10:31:26	56.09	24.30	31.80
08:14:11	54.59	24.23	30.35	10:31:31	56.16	24.36	31.80
08:14:16	54.78	24.23	30.54	10:31:36	56.28	24.36	31.92
08:14:21	54.88	24.22	30.67	10:31:41	56.41	24.43	31.98
08:14:26	55.01	24.28	30.73	10:31:46	56.53	24.43	32.11
08:14:31	55.07	24.35	30.73	10:31:51	56.66	24.49	32.17
08:14:36	55.25	24.33	30.92	10:31:56	56.72	24.56	32.17
08:14:41	55.31	24.39	30.91	10:32:01	56.85	24.56	32.29
08:14:46	55.43	24.39	31.04	10:32:06	56.97	24.56	32.42
08:14:51	55.54	24.44	31.10	10:32:11	57.10	24.62	32.48
08:14:56	55.61	24.44	31.16	10:32:16	57.16	24.62	32.54
08:15:01	55.73	24.51	31.23	10:32:21	57.29	24.75	32.54
08:15:06	55.86	24.51	31.35	10:32:26	57.35	24.81	32.54
08:15:11	55.92	24.57	31.35	10:32:31	57.48	24.88	32.60
08:15:16	56.09	24.56	31.54	10:32:36	57.60	24.88	32.72
08:15:21	56.16	24.56	31.60	10:32:41	57.67	24.94	32.72
08:15:26	56.28	24.68	31.60	10:32:46	57.79	24.88	32.91
08:15:31	56.41	24.68	31.72	10:32:51	57.85	25.01	32.85
08:15:36	56.45	24.73	31.72	10:32:56	57.98	25.07	32.91
08:15:41	56.58	24.80	31.78	10:33:01	58.11	25.07	33.03
08:15:46	56.71	24.86	31.84	10:33:06	58.16	25.06	33.10
08:15:51	56.83	24.86	31.97	10:33:11	58.22	25.19	33.03
08:15:56	56.88	24.98	31.90	10:33:16	58.36	25.20	33.16
08:16:01	57.00	24.98	32.03	10:33:21	58.42	25.20	33.22
08:16:06	57.07	25.04	32.03	10:33:26	58.54	25.27	33.28
08:16:11	57.18	25.02	32.15	10:33:31	58.61	25.33	33.28
08:16:16	57.24	25.09	32.15	10:33:36	58.73	25.39	33.34
08:16:21	57.37	25.09	32.28	10:33:41	58.80	25.39	33.40
08:16:26	57.49	25.15	32.34	10:33:46	58.92	25.46	33.46

Table 10 (continued)

08:16:31	57.54	25.14	32.40	10:33:51	58.98	25.46	33.53
08:16:36	57.60	25.14	32.47	10:33:56	59.11	25.46	33.65
08:16:41	57.73	25.20	32.53	10:34:01	59.17	25.52	33.65
08:16:46	57.79	25.27	32.52	10:34:06	59.24	25.59	33.65
08:16:51	57.90	25.31	32.59	10:34:11	59.36	25.72	33.64
08:16:56	58.03	25.38	32.65	10:34:16	59.42	25.72	33.71
08:17:01	58.09	25.38	32.71	10:34:21	59.55	25.78	33.77
08:17:06	58.20	25.43	32.77	10:34:26	59.60	25.77	33.83
08:17:11	58.28	25.51	32.77	10:34:31	59.68	25.85	33.83
08:17:16	58.32	25.43	32.90	10:34:36	59.74	25.91	33.83
08:17:21	58.45	25.49	32.96	10:34:41	59.86	25.98	33.89
08:17:26	58.51	25.56	32.96	10:34:46	59.93	26.04	33.89
08:17:31	58.64	25.62	33.02	10:34:51	60.05	26.10	33.95
08:17:36	58.68	25.60	33.08	10:34:56	60.12	26.10	34.01
08:17:41	58.75	25.67	33.08	10:35:01	60.17	26.16	34.01
08:17:46	58.87	25.73	33.14	10:35:06	60.30	26.17	34.13
08:17:51	58.94	25.73	33.20	10:35:11	60.37	26.23	34.13
08:17:56	58.98	25.85	33.14	10:35:16	60.42	26.29	34.13
08:18:01	59.11	25.85	33.26	10:35:21	60.48	26.29	34.19
08:18:06	59.17	25.91	33.26	10:35:26	60.55	26.35	34.19
08:18:11	59.30	25.97	33.32	10:35:31	60.62	26.43	34.19
08:18:16	59.30	25.97	33.32	10:35:36	60.74	26.49	34.25
08:18:21	59.41	26.02	33.38	10:35:41	60.81	26.56	34.25
08:18:26	59.53	26.09	33.44	10:35:46	60.87	26.56	34.31
08:18:31	59.60	26.02	33.57	10:35:51	60.93	26.49	34.44
08:18:36	59.66	26.09	33.57	10:35:56	61.00	26.69	34.31
08:18:41	59.78	26.22	33.57	10:36:01	61.12	26.69	34.44
08:18:46	59.83	26.27	33.57	10:36:06	61.18	26.69	34.50
08:18:51	59.89	26.20	33.69	10:36:11	61.25	26.75	34.50
08:18:56	59.96	26.33	33.63	10:36:16	61.18	26.69	34.50
08:19:01	60.08	26.33	33.75	10:36:21	61.44	26.75	34.68
08:19:06	60.13	26.38	33.75	10:36:26	61.56	26.75	34.81
08:19:11	60.21	26.46	33.75	10:36:31	61.62	26.88	34.74
08:19:16	60.25	26.51	33.75	10:36:36	61.75	26.94	34.81
08:19:21	60.32	26.57	33.75	10:36:41	61.81	26.94	34.87
08:19:26	60.44	26.57	33.87	10:36:46	61.88	27.01	34.87
08:19:31	60.44	26.57	33.87	10:36:51	62.00	27.07	34.93
08:19:36	60.57	26.70	33.87	10:36:56	62.06	27.07	34.99
08:19:41	60.63	26.64	34.00	10:37:01	62.06	27.20	34.86
08:19:46	60.68	26.75	33.93	10:37:06	62.25	27.27	34.99
08:19:51	60.74	26.81	33.93	10:37:11	62.25	27.27	34.99
08:19:56	60.80	26.68	34.12	10:37:16	62.32	27.27	35.05
08:20:01	60.93	26.81	34.12	10:37:21	62.38	27.27	35.11
08:20:06	60.99	26.88	34.11	10:37:26	62.44	27.40	35.04
08:20:11	61.04	26.86	34.18	10:37:31	62.57	27.40	35.17

Table 10 (continued)

08:20:16	61.12	26.88	34.24	10:37:36	62.63	27.53	35.10
08:20:21	61.23	26.99	34.24	10:37:41	62.69	27.59	35.10
08:20:26	61.23	26.99	34.24	10:37:46	62.76	27.65	35.10
08:20:31	61.35	27.12	34.23	10:37:51	62.82	27.78	35.03
08:20:36	61.35	27.12	34.23	10:37:56	62.88	27.85	35.03
08:20:41	61.46	27.17	34.30	10:38:01	63.01	27.85	35.16
08:20:46	61.53	27.23	34.29	10:38:06	63.01	27.85	35.16
08:20:51	61.59	27.23	34.36	10:38:11	63.07	27.85	35.22
08:20:55	61.65	27.23	34.42	10:38:16	63.07	27.91	35.16
08:21:00	61.72	27.30	34.42	10:38:21	63.18	27.90	35.28
08:21:05	61.84	27.43	34.41	10:38:26	63.26	27.98	35.28
08:21:11	61.82	27.41	34.41	10:38:31	63.26	28.04	35.22
08:21:16	61.89	27.35	34.54	10:38:36	63.32	28.11	35.21
08:21:21	61.95	27.41	34.54	10:38:41	63.38	28.17	35.21
08:21:26	62.08	27.47	34.60	10:38:46	63.51	28.17	35.34
08:21:31	62.14	27.47	34.66	10:38:51	63.51	28.24	35.27
08:21:36	62.20	27.60	34.60	10:38:56	63.63	28.24	35.40
08:21:41	62.19	27.59	34.60	10:39:01	63.62	28.29	35.33
08:21:46	62.26	27.60	34.66	10:39:06	63.70	28.37	35.33
08:21:51	62.31	27.65	34.66	10:39:11	63.84	28.45	35.39
08:21:56	62.44	27.72	34.72	10:39:16	63.84	28.38	35.46
08:22:01	62.50	27.78	34.72	10:39:21	63.90	28.45	35.46
08:22:06	62.50	27.85	34.65	10:39:26	63.95	28.43	35.52
08:22:11	62.56	27.91	34.65	10:39:31	64.03	28.58	35.45
08:22:16	62.63	27.91	34.72	10:39:36	64.14	28.56	35.58
08:22:21	62.75	27.98	34.78	10:39:41	64.15	28.51	35.64
08:22:26	62.80	28.02	34.78	10:39:46	64.22	28.64	35.58
08:22:31	62.86	28.02	34.84	10:39:51	64.28	28.70	35.57
08:22:36	62.92	28.02	34.90	10:39:56	64.25	28.68	35.57
08:22:41	62.92	28.15	34.77	10:40:01	64.34	28.77	35.57
08:22:46	62.99	28.15	34.83	10:40:06	64.34	28.83	35.51
08:22:51	63.11	28.15	34.96	10:40:11	64.47	28.90	35.57
08:22:56	63.18	28.15	35.02	10:40:16	64.51	28.82	35.70
08:23:01	63.22	28.27	34.96	10:40:21	64.53	28.90	35.63
08:23:06	63.29	28.20	35.08	10:40:26	64.66	29.03	35.63
08:23:11	63.29	28.33	34.96	10:40:31	64.72	29.09	35.63
08:23:16	63.35	28.39	34.95	10:40:36	64.78	29.03	35.75
08:23:21	63.41	28.39	35.02	10:40:41	64.78	29.16	35.63
08:23:26	63.47	28.46	35.01	10:40:46	64.91	29.22	35.69
08:23:30	63.47	28.52	34.95	10:40:51	64.97	29.29	35.68
08:23:35	63.60	28.59	35.01	10:40:56	65.03	29.35	35.68
08:23:40	63.73	28.65	35.07	10:41:01	65.03	29.29	35.75
08:23:45	63.66	28.65	35.01	10:41:06	65.10	29.35	35.75
08:23:50	63.77	28.64	35.14	10:41:11	65.16	29.35	35.81
08:23:55	63.83	28.77	35.07	10:41:16	65.22	29.54	35.68

Table 10 (continued)

08:24:00	63.83	28.77	35.07	10:41:21	65.28	29.54	35.74
08:24:05	63.90	28.77	35.13	10:41:26	65.28	29.54	35.74
08:24:10	63.96	28.83	35.13	10:41:31	65.35	29.61	35.74
08:24:15	64.02	28.89	35.13	10:41:36	65.43	29.62	35.80
08:24:20	64.07	28.81	35.26	10:41:41	65.47	29.67	35.80
08:24:25	64.15	28.96	35.19	10:41:46	65.47	29.74	35.74
08:24:30	64.21	28.96	35.25	10:41:51	65.60	29.74	35.86
08:24:35	64.20	29.07	35.12	10:41:56	65.60	29.67	35.93
08:24:40	64.32	29.07	35.25	10:42:01	65.60	29.80	35.80
08:24:45	64.32	29.07	35.25	10:42:06	65.72	29.80	35.92
08:24:50	64.38	29.20	35.18	10:42:11	65.71	29.92	35.79
08:24:55	64.45	29.20	35.25	10:42:16	65.79	29.93	35.86
08:25:00	64.51	29.14	35.37	10:42:21	65.85	29.80	36.05
08:25:05	64.57	29.20	35.37	10:42:26	65.85	29.93	35.92
08:25:10	64.62	29.25	35.37	10:42:31	65.91	30.06	35.85
08:25:15	64.62	29.31	35.31	10:42:36	65.98	30.06	35.92
08:25:20	64.68	29.31	35.37	10:42:41	66.04	30.19	35.85
08:25:25	64.75	29.31	35.43	10:42:46	65.72	30.12	35.60
08:25:30	64.81	29.38	35.43	10:42:51	65.03	30.06	34.97
08:25:35	64.86	29.43	35.43	10:42:56	64.59	30.25	34.34
08:25:41	64.86	29.49	35.36	10:43:01	64.15	30.19	33.96
08:25:46	64.92	29.43	35.49	10:43:06	63.40	30.25	33.15
08:25:51	64.98	29.49	35.49	10:43:11	63.02	30.25	32.77
08:25:56	65.04	29.49	35.55	10:43:16	62.76	30.37	32.39
08:26:01	65.04	29.49	35.55	10:43:21	62.14	30.32	31.82
08:26:05	65.09	29.60	35.49	10:43:26	61.94	30.31	31.63
08:26:10	65.17	29.69	35.48	10:43:31	61.45	30.45	31.00
08:26:15	65.22	29.67	35.55	10:43:36	61.14	30.51	30.62
08:26:20	65.30	29.75	35.55	10:43:41	61.26	30.45	30.82
08:26:25	65.34	29.73	35.61	10:43:46	61.45	30.51	30.94
08:26:30	65.41	29.80	35.61	10:43:51	61.64	30.71	30.93
08:26:35	65.41	29.86	35.54	10:43:56	61.45	30.64	30.81
08:26:40	65.45	29.91	35.54	10:44:01	60.89	30.71	30.18
08:26:45	65.51	29.91	35.60	10:44:06	60.32	30.84	29.49
08:26:50	65.58	30.04	35.54	10:44:11	60.32	30.77	29.55
08:26:55	65.58	29.98	35.60	10:44:16	60.57	30.77	29.80
08:27:00	65.64	30.04	35.60	10:44:21	60.95	30.84	30.11
08:27:05	65.70	29.98	35.73	10:44:26	61.26	30.77	30.49
08:27:10	65.70	30.10	35.60	10:44:31	61.51	30.77	30.74
08:27:15	65.83	30.10	35.72	10:44:36	61.83	30.96	30.86
08:27:20	65.89	30.17	35.72	10:44:41	62.08	31.03	31.05
08:27:25	65.88	30.22	35.66	10:44:46	62.27	31.09	31.17
08:27:30	65.94	30.28	35.66	10:44:51	62.52	31.09	31.43
08:27:35	65.94	30.28	35.66	10:44:55	62.77	31.09	31.68
08:27:40	66.00	30.28	35.72	10:45:00	62.96	31.16	31.80

Table 10 (continued)

08:27:45	66.06	30.35	35.72	10:45:05	63.15	31.09	32.05
08:27:50	66.06	30.48	35.59	10:45:10	63.34	31.22	32.11
08:27:55	66.19	30.48	35.71	10:45:15	63.46	31.22	32.24
08:28:00	66.17	30.39	35.78	10:45:20	63.65	31.22	32.43
08:28:05	66.17	30.52	35.65	10:45:25	63.84	31.29	32.55
08:28:10	66.30	30.52	35.78	10:45:30	63.95	31.28	32.68
08:28:15	66.30	30.59	35.71	10:45:35	64.09	31.29	32.80
08:28:20	66.36	30.65	35.71	10:45:40	64.28	31.42	32.86
08:28:25	66.44	30.79	35.64	10:45:45	64.34	31.35	32.99
08:28:30	66.49	30.78	35.71	10:45:50	64.46	31.34	33.12
08:28:35	66.49	30.72	35.77	10:45:55	64.59	31.42	33.18
08:28:40	66.47	30.77	35.71	10:46:00	64.66	31.48	33.18
08:28:45	66.54	30.77	35.77	10:46:05	64.84	31.55	33.30
08:28:50	66.60	30.77	35.83	10:46:10	64.91	31.48	33.43
08:28:55	66.66	30.89	35.77	10:46:15	65.03	31.67	33.36
08:29:00	66.66	30.89	35.77	10:46:20	65.16	31.61	33.55
08:29:05	66.79	30.96	35.83	10:46:26	65.22	31.61	33.61
08:29:10	66.79	30.96	35.83	10:46:31	65.28	31.55	33.74
08:29:15	66.85	30.96	35.89	10:46:36	65.41	31.67	33.74
08:29:20	66.91	31.02	35.89	10:46:41	65.54	31.80	33.73
08:29:25	66.91	31.09	35.82	10:46:46	65.61	31.82	33.79
08:29:30	66.98	31.02	35.95	10:46:51	65.68	31.82	33.86
08:29:35	66.98	31.09	35.89	10:46:56	65.72	31.87	33.86
08:29:40	67.04	31.09	35.95	10:47:01	65.85	31.80	34.05
08:29:45	67.09	31.14	35.95	10:47:06	65.91	31.87	34.04
08:29:50	67.10	31.15	35.95	10:47:11	65.99	31.88	34.11
08:29:55	67.15	31.27	35.88	10:47:16	66.05	32.01	34.04
08:30:00	67.21	31.27	35.94	10:47:21	66.18	32.01	34.17
08:30:05	67.27	31.33	35.94	10:47:26	66.18	31.88	34.30
08:30:10	67.28	31.41	35.88	10:47:30	66.31	31.95	34.36
08:30:15	67.27	31.33	35.94	10:47:35	66.35	32.06	34.29
08:30:20	67.34	31.46	35.88	10:47:40	66.43	32.14	34.29
08:30:25	67.38	31.44	35.94	10:47:45	66.49	32.21	34.29
08:30:30	67.46	31.52	35.94	10:47:50	66.56	32.14	34.41
08:30:35	67.46	31.59	35.87	10:47:55	66.62	32.34	34.28
08:30:40	67.46	31.65	35.81	10:48:00	66.67	32.26	34.41
08:30:45	67.51	31.51	36.00	10:48:05	66.68	32.27	34.41
08:30:50	67.57	31.57	36.00	10:48:10	66.87	32.27	34.60
08:30:55	67.57	31.57	36.00	10:48:15	66.87	32.34	34.53
08:31:00	67.63	31.64	36.00	10:48:20	66.93	32.34	34.60
08:31:05	67.63	31.64	36.00	10:48:25	67.00	32.27	34.72
08:31:10	67.76	31.70	36.06	10:48:30	67.06	32.27	34.79
08:31:15	67.76	31.70	36.06	10:48:35	67.06	32.34	34.72
08:31:20	67.76	31.83	35.93	10:48:40	67.12	32.40	34.72
08:31:25	67.82	31.77	36.06	10:48:45	67.20	32.48	34.72

Table 10 (continued)

08:31:30	67.87	31.75	36.12	10:48:50	67.26	32.55	34.72
08:31:35	67.87	31.81	36.06	10:48:55	67.39	32.48	34.91
08:31:40	67.95	31.90	36.05	10:49:00	67.39	32.48	34.91
08:31:45	68.00	31.94	36.05	10:49:05	67.44	32.40	35.04
08:31:50	68.00	31.94	36.05	10:49:10	67.50	32.34	35.16
08:31:55	68.07	32.02	36.05	10:49:15	67.52	32.48	35.03
08:32:00	68.12	31.94	36.18	10:49:20	67.64	32.55	35.09
08:32:05	68.12	32.14	35.98	10:49:25	67.64	32.55	35.09
08:32:10	68.12	32.01	36.11	10:49:30	67.70	32.61	35.09
08:32:15	68.18	32.14	36.05	10:49:35	67.77	32.61	35.16
08:32:20	68.25	32.07	36.17	10:49:40	67.83	32.61	35.22
08:32:25	68.25	32.27	35.98	10:49:45	67.83	32.55	35.28
08:32:30	68.31	32.20	36.11	10:49:50	67.89	32.68	35.22
08:32:35	68.37	32.20	36.17	10:49:55	67.96	32.74	35.22
08:32:40	68.36	32.31	36.04	10:50:00	67.96	32.81	35.15
08:32:45	68.36	32.31	36.04	10:50:05	68.03	32.76	35.28
08:32:50	68.44	32.40	36.04	10:50:10	68.10	32.76	35.34
08:32:55	68.50	32.33	36.17	10:50:15	68.16	32.89	35.27
08:33:00	68.48	32.44	36.04	10:50:20	68.22	32.82	35.40
08:33:05	68.55	32.51	36.04	10:50:25	68.22	32.89	35.34
08:33:10	68.61	32.51	36.10	10:50:30	68.29	33.02	35.27
08:33:15	68.61	32.38	36.23	10:50:35	68.29	33.02	35.27
08:33:20	68.62	32.45	36.17	10:50:40	68.35	33.02	35.33
08:33:25	68.67	32.44	36.23	10:50:45	68.41	32.89	35.53
08:33:30	68.73	32.51	36.23	10:50:50	68.47	33.02	35.46
08:33:35	68.73	32.57	36.16	10:50:55	68.54	33.14	35.39
08:33:40	68.80	32.57	36.22	10:51:00	68.54	33.08	35.46
08:33:45	68.86	32.51	36.35	10:51:05	68.66	33.14	35.52
08:33:50	68.86	32.64	36.22	10:51:10	68.68	33.03	35.65
08:33:55	68.92	32.70	36.22	10:51:15	68.73	33.02	35.71
08:34:00	68.92	32.70	36.22	10:51:20	68.73	33.02	35.71
08:34:05	68.93	32.71	36.22	10:51:25	68.79	33.02	35.77
08:34:10	69.00	32.84	36.15	10:51:30	68.87	33.16	35.71
08:34:15	68.99	32.83	36.15	10:51:35	68.87	33.16	35.71
08:34:20	69.11	32.83	36.28	10:51:40	68.93	33.35	35.58
08:34:25	69.10	32.75	36.34	10:51:45	68.93	33.23	35.70
08:34:30	69.11	32.83	36.28	10:51:50	68.99	33.35	35.64
08:34:35	69.10	32.94	36.15	10:51:55	68.99	33.35	35.64
08:34:40	69.22	32.94	36.28	10:52:00	69.06	33.29	35.77
08:34:45	69.22	32.94	36.28	10:52:05	69.12	33.42	35.70
08:34:50	69.28	32.94	36.34	10:52:10	69.18	33.55	35.63
08:34:55	69.29	33.02	36.28	10:52:15	69.18	33.35	35.83
08:35:00	69.28	33.07	36.21	10:52:20	69.24	33.55	35.70
08:35:05	69.35	33.01	36.34	10:52:25	69.24	33.48	35.76
08:35:10	69.36	33.08	36.27	10:52:30	69.26	33.56	35.70

Table 10 (continued)

08:35:15	69.42	33.21	36.21	10:52:35	69.32	33.50	35.82
08:35:20	69.41	33.27	36.14	10:52:40	69.39	33.56	35.82
08:35:25	69.48	33.15	36.34	10:52:45	69.37	33.62	35.76
08:35:30	69.53	33.14	36.40	10:52:50	69.45	33.56	35.88
08:35:35	69.53	33.27	36.27	10:52:55	69.51	33.76	35.75
08:35:40	69.61	33.28	36.33	10:53:00	69.57	33.69	35.88
08:35:45	69.60	33.33	36.27	10:53:05	69.51	33.82	35.69
08:35:50	69.66	33.33	36.33	10:53:10	69.57	33.63	35.95
08:35:55	69.66	33.33	36.33	10:53:15	69.63	33.62	36.01
08:36:00	69.72	33.27	36.46	10:53:20	69.72	33.77	35.94
08:36:05	69.73	33.28	36.46	10:53:25	69.72	33.77	35.94
08:36:10	69.72	33.40	36.33	10:53:30	69.70	33.63	36.07
08:36:15	69.77	33.44	36.33	10:53:35	69.78	33.77	36.00
08:36:20	69.77	33.44	36.33	10:53:40	69.77	33.96	35.81
08:36:25	69.83	33.51	36.32	10:53:45	69.83	33.83	36.00
08:36:30	69.91	33.52	36.39	10:53:50	69.84	33.90	35.94
08:36:35	69.90	33.64	36.26	10:53:55	69.89	33.96	35.94
08:36:40	69.90	33.70	36.19	10:54:00	69.97	33.84	36.13
08:36:45	69.96	33.57	36.39	10:54:05	69.97	34.16	35.81
08:36:50	69.96	33.57	36.39	10:54:10	70.03	34.03	36.00
08:36:55	70.02	33.57	36.45	10:54:15	70.05	34.05	36.00
08:37:00	70.02	33.64	36.38	10:54:20	70.05	33.92	36.13
08:37:05	70.10	33.58	36.51	10:54:25	70.11	34.11	35.99
08:37:10	70.15	33.64	36.51	10:54:30	70.11	34.05	36.06
08:37:15	70.15	33.70	36.44	10:54:35	70.23	34.18	36.06
08:37:20	70.15	33.64	36.51	10:54:40	70.23	34.18	36.06
08:37:25	70.22	33.78	36.44	10:54:45	70.22	34.23	35.99
08:37:30	70.19	33.82	36.38	10:54:50	70.30	34.24	36.05
08:37:35	70.27	33.70	36.57	10:54:55	70.30	34.24	36.05
08:37:40	70.27	33.77	36.51	10:55:00	70.36	34.24	36.12
08:37:45	70.27	33.90	36.38	10:55:05	70.36	34.18	36.18
08:37:50	70.34	33.90	36.44	10:55:10	70.38	34.07	36.31
08:37:55	70.40	33.96	36.44	10:55:15	70.43	34.12	36.31
08:38:00	70.40	33.90	36.50	10:55:20	70.44	34.32	36.12
08:38:05	70.40	33.90	36.50	10:55:25	70.50	34.32	36.18
08:38:10	70.46	33.95	36.50	10:55:30	70.56	34.39	36.18
08:38:15	70.51	34.01	36.50	10:55:35	70.56	34.32	36.24
08:38:20	70.51	34.01	36.50	10:55:40	70.62	34.18	36.43
08:38:25	70.51	34.01	36.50	10:55:45	70.62	34.38	36.24
08:38:30	70.57	33.94	36.63	10:55:50	70.63	34.26	36.37
08:38:35	70.58	33.95	36.63	10:55:55	70.69	34.39	36.30
08:38:40	70.63	34.01	36.62	10:56:00	70.69	34.52	36.17
08:38:45	70.70	34.14	36.56	10:56:05	70.74	34.51	36.23
08:38:50	70.70	34.07	36.62	10:56:10	70.75	34.45	36.30
08:38:55	70.71	34.15	36.56	10:56:15	70.75	34.39	36.36

Table 10 (continued)

08:39:00	70.76	34.14	36.62	10:56:20	70.80	34.44	36.36
08:39:05	70.77	34.15	36.62	10:56:25	70.82	34.59	36.23
08:39:10	70.76	34.27	36.49	10:56:30	70.89	34.66	36.23
08:39:15	70.82	34.14	36.68	10:56:35	70.89	34.73	36.17
08:39:20	70.82	34.14	36.68	10:56:40	70.96	34.60	36.36
08:39:25	70.88	34.13	36.75	10:56:45	70.96	34.73	36.23
08:39:30	70.88	34.26	36.62	10:56:50	70.96	34.66	36.29
08:39:35	70.96	34.28	36.68	10:56:55	71.01	34.78	36.23
08:39:40	70.93	34.38	36.55	10:57:00	71.08	34.79	36.29
08:39:45	70.93	34.25	36.68	10:57:05	71.08	34.79	36.29
08:39:50	71.00	34.25	36.74	10:57:10	71.15	34.66	36.48
08:39:55	71.00	34.38	36.62	10:57:15	71.15	34.73	36.42
08:40:00	71.00	34.38	36.62	10:57:20	71.15	34.73	36.42
08:40:05	71.06	34.51	36.55	10:57:25	71.21	34.86	36.35
08:40:10	71.12	34.44	36.68	10:57:30	71.21	34.93	36.29
08:40:15	71.12	34.51	36.61	10:57:35	71.26	34.91	36.35
08:40:20	71.12	34.64	36.48	10:57:40	71.27	34.86	36.41
08:40:25	71.18	34.64	36.55	10:57:45	71.35	34.94	36.41
08:40:30	71.18	34.64	36.55	10:57:50	71.35	34.94	36.41
08:40:35	71.23	34.56	36.67	10:57:55	71.40	34.99	36.41
08:40:40	71.17	34.56	36.61	10:58:00	71.40	35.05	36.35
08:40:45	71.23	34.56	36.67	10:58:05	71.40	34.99	36.41
08:40:50	71.30	34.57	36.74	10:58:10	71.46	35.06	36.41
08:40:55	71.30	34.57	36.74	10:58:15	71.48	35.07	36.41
08:41:00	71.30	34.76	36.54	10:58:20	71.48	35.13	36.34
08:41:05	71.42	34.75	36.67	10:58:25	71.48	35.07	36.41
08:41:10	71.43	34.70	36.73	10:58:30	71.54	35.20	36.34
08:41:15	71.43	34.70	36.73	10:58:35	71.60	35.20	36.41
				10:58:40	71.60	35.32	36.28
				10:58:45	71.60	35.26	36.34
				10:58:50	71.60	35.26	36.34
				10:58:55	71.66	35.26	36.40
				10:59:00	71.66	35.32	36.34
				10:59:05	71.73	35.32	36.40
				10:59:10	71.72	35.32	36.39
				10:59:15	71.79	35.32	36.47
				10:59:20	71.78	35.44	36.34
				10:59:25	71.84	35.38	36.46
				10:59:30	71.85	35.32	36.53
				10:59:35	71.85	35.39	36.46
				10:59:40	71.85	35.32	36.53
				10:59:45	71.90	35.44	36.46
				10:59:50	71.97	35.44	36.52
				10:59:55	71.92	35.45	36.46
				11:00:00	71.98	35.45	36.52

Table 10 (continued)

					11:00:05	71.98	35.71		36.27
					11:00:10	72.04	35.52		36.52
					11:00:15	72.04	35.52		36.52
					11:00:20	72.09	35.50		36.59
					11:00:25	72.03	35.64		36.39
					11:00:30	72.16	35.51		36.65
					11:00:35	72.17	35.45		36.71
					11:00:40	72.10	35.78		36.33
					11:00:45	72.17	35.65		36.52
					11:00:50	72.17	35.78		36.39
					11:00:55	72.22	35.70		36.52
					11:01:00	72.23	35.58		36.65
					11:01:05	72.23	35.91		36.32

Table 11: Test Data for 275°C Cured Epoxy/Glass Composite (Through Layers)

Time	Ch 2	Ch 3	Temp
	Bottom	Top	Diff °C
	EGC 275	EGC 275	EGC 275
09:12:06	26.57	24.51	2.07
09:12:11	27.09	24.44	2.65
09:12:16	27.65	24.48	3.16
09:12:20	28.32	24.51	3.81
09:12:25	28.96	24.51	4.46
09:12:30	29.61	24.51	5.10
09:12:35	30.19	24.51	5.68
09:12:40	30.82	24.49	6.33
09:12:45	31.35	24.51	6.84
09:12:50	31.99	24.50	7.49
09:12:55	32.52	24.51	8.01
09:13:00	33.03	24.51	8.52
09:13:05	33.54	24.50	9.04
09:13:10	34.07	24.57	9.49
09:13:16	34.57	24.50	10.07
09:13:21	34.96	24.56	10.40
09:13:26	35.55	24.51	11.04
09:13:31	35.94	24.57	11.37
09:13:36	36.45	24.57	11.88
09:13:41	36.78	24.51	12.27
09:13:46	37.23	24.57	12.66
09:13:51	37.62	24.57	13.04
09:13:56	38.07	24.57	13.50
09:14:01	38.39	24.57	13.82
09:14:06	38.71	24.57	14.14
09:14:11	39.09	24.56	14.53
09:14:16	39.42	24.57	14.85
09:14:21	39.81	24.51	15.30
09:14:26	40.14	24.57	15.56
09:14:31	40.51	24.56	15.95
09:14:36	40.78	24.57	16.21
09:14:41	41.17	24.57	16.60
09:14:46	41.43	24.64	16.79
09:14:51	41.75	24.57	17.18
09:14:55	42.07	24.64	17.43
09:15:00	42.33	24.57	17.76
09:15:05	42.64	24.56	18.08
09:15:10	42.91	24.64	18.27
09:15:15	43.17	24.57	18.60
09:15:20	43.49	24.64	18.86
09:15:25	43.75	24.64	19.11

Table 11 (continued)

09:15:30	44.01	24.64		19.37
09:15:35	44.27	24.64		19.63
09:15:40	44.53	24.64		19.89
09:15:45	44.72	24.64		20.08
09:15:50	44.97	24.63		20.34
09:15:55	45.30	24.64		20.66
09:16:00	45.49	24.57		20.92
09:16:05	45.69	24.64		21.05
09:16:10	45.95	24.70		21.24
09:16:15	46.14	24.64		21.50
09:16:20	46.33	24.64		21.70
09:16:25	46.58	24.69		21.89
09:16:30	46.79	24.64		22.15
09:16:35	46.98	24.70		22.28
09:16:40	47.17	24.70		22.47
09:16:45	47.30	24.70		22.60
09:16:50	47.56	24.70		22.86
09:16:55	47.82	24.70		23.12
09:17:00	47.94	24.69		23.25
09:17:05	48.14	24.70		23.44
09:17:10	48.29	24.78		23.50
09:17:15	48.47	24.77		23.70
09:17:20	48.68	24.85		23.83
09:17:25	48.80	24.78		24.02
09:17:30	49.00	24.85		24.15
09:17:35	49.19	24.85		24.34
09:17:40	49.32	24.91		24.41
09:17:45	49.51	24.91		24.60
09:17:50	49.63	24.90		24.73
09:17:55	49.84	24.98		24.86
09:18:00	50.03	24.98		25.05
09:18:05	50.16	24.98		25.18
09:18:10	50.29	24.98		25.31
09:18:15	50.47	25.03		25.44
09:18:20	50.61	25.04		25.57
09:18:25	50.67	25.10		25.57
09:18:30	50.86	25.10		25.76
09:18:35	51.06	25.11		25.96
09:18:40	51.13	25.11		26.02
09:18:45	51.26	25.17		26.09
09:18:50	51.39	25.17		26.22
09:18:55	51.52	25.24		26.28
09:19:00	51.64	25.24		26.40
09:19:05	51.77	25.24		26.54
09:19:10	51.97	25.24		26.73

Table 11 (continued)

09:19:15	52.10	25.24		26.86
09:19:20	52.18	25.32		26.86
09:19:25	52.36	25.36		26.99
09:19:30	52.54	25.35		27.18
09:19:35	52.61	25.43		27.18
09:19:40	52.80	25.43		27.37
09:19:45	52.86	25.49		27.37
09:19:50	53.06	25.51		27.55
09:19:55	53.11	25.56		27.55
09:20:00	53.25	25.57		27.68
09:20:05	53.35	25.55		27.80
09:20:10	53.55	25.62		27.93
09:20:15	53.61	25.62		27.99
09:20:20	53.74	25.69		28.05
09:20:25	53.87	25.75		28.11
09:20:30	53.99	25.69		28.30
09:20:35	54.12	25.75		28.37
09:20:40	54.24	25.82		28.43
09:20:45	54.31	25.82		28.49
09:20:50	54.45	25.90		28.55
09:20:55	54.57	25.90		28.68
09:21:00	54.64	25.96		28.67
09:21:05	54.76	26.03		28.73
09:21:10	54.89	25.96		28.92
09:21:15	55.01	26.09		28.92
09:21:20	55.12	26.01		29.11
09:21:25	55.20	26.09		29.11
09:21:30	55.33	26.16		29.17
09:21:35	55.45	26.16		29.30
09:21:40	55.52	26.22		29.30
09:21:45	55.58	26.15		29.43
09:21:50	55.70	26.28		29.42
09:21:55	55.83	26.28		29.54
09:22:00	55.89	26.35		29.54
09:22:05	56.02	26.41		29.60
09:22:10	56.14	26.41		29.73
09:22:15	56.21	26.41		29.79
09:22:20	56.33	26.48		29.85
09:22:25	56.46	26.48		29.98
09:22:30	56.52	26.54		29.98
09:22:35	56.58	26.61		29.98
09:22:40	56.65	26.67		29.97
09:22:45	56.76	26.60		30.16
09:22:50	56.90	26.74		30.16
09:22:55	56.96	26.67		30.29

Table 11 (continued)

09:23:00	57.09	26.80		30.28
09:23:05	57.15	26.74		30.41
09:23:10	57.26	26.86		30.41
09:23:15	57.34	26.87		30.47
09:23:20	57.39	26.92		30.47
09:23:25	57.53	26.99		30.53
09:23:30	57.57	26.98		30.59
09:23:35	57.71	26.99		30.72
09:23:40	57.78	27.06		30.72
09:23:45	57.83	27.11		30.72
09:23:50	57.88	27.10		30.78
09:23:55	58.03	27.19		30.84
09:24:00	58.02	27.24		30.77
09:24:05	58.15	27.32		30.84
09:24:10	58.27	27.31		30.96
09:24:15	58.33	27.24		31.09
09:24:20	58.41	27.32		31.09
09:24:25	58.53	27.38		31.15
09:24:30	58.52	27.44		31.08
09:24:35	58.65	27.50		31.14
09:24:40	58.72	27.51		31.21
09:24:45	58.78	27.51		31.27
09:24:50	58.91	27.58		31.33
09:24:55	58.97	27.64		31.33
09:25:00	59.02	27.70		31.33
09:25:05	59.10	27.71		31.39
09:25:10	59.16	27.71		31.45
09:25:15	59.29	27.77		31.52
09:25:20	59.29	27.83		31.45
09:25:25	59.41	27.83		31.58
09:25:30	59.41	27.90		31.51
09:25:35	59.54	27.96		31.57
09:25:40	59.65	27.95		31.70
09:25:45	59.66	28.03		31.63
09:25:50	59.79	28.09		31.70
09:25:55	59.85	28.09		31.76
09:26:00	59.91	28.09		31.82
09:26:05	59.98	28.16		31.82
09:26:10	60.04	28.22		31.82
09:26:15	60.09	28.21		31.88
09:26:20	60.17	28.29		31.88
09:26:25	60.27	28.27		32.00
09:26:30	60.29	28.29		32.00
09:26:35	60.41	28.41		32.00
09:26:40	60.48	28.35		32.13

Table 11 (continued)

09:26:45	60.48	28.48		32.00
09:26:50	60.60	28.54		32.06
09:26:55	60.67	28.48		32.19
09:27:00	60.73	28.61		32.12
09:27:05	60.73	28.54		32.19
09:27:10	60.86	28.61		32.25
09:27:15	60.86	28.67		32.18
09:27:20	60.98	28.74		32.24
09:27:25	60.97	28.66		32.31
09:27:30	61.04	28.74		32.31
09:27:35	61.17	28.74		32.43
09:27:40	61.23	28.87		32.37
09:27:45	61.30	28.93		32.36
09:27:50	61.30	28.87		32.43
09:27:55	61.35	28.92		32.43
09:28:00	61.42	28.93		32.49
09:28:05	61.47	28.99		32.49
09:28:10	61.55	29.06		32.49
09:28:15	61.61	29.06		32.55
09:28:20	61.67	29.19		32.48
09:28:25	61.74	29.25		32.48
09:28:30	61.80	29.19		32.61
09:28:35	61.86	29.25		32.61
09:28:40	61.92	29.32		32.60
09:28:45	61.92	29.38		32.54
09:28:50	62.04	29.37		32.67
09:28:55	62.05	29.45		32.60
09:29:00	62.11	29.51		32.60
09:29:05	62.18	29.45		32.73
09:29:10	62.23	29.63		32.60
09:29:15	62.24	29.58		32.66
09:29:20	62.30	29.64		32.66
09:29:25	62.34	29.62		32.72
09:29:30	62.43	29.71		32.72
09:29:35	62.49	29.71		32.78
09:29:40	62.55	29.84		32.72
09:29:45	62.60	29.76		32.84
09:29:50	62.68	29.77		32.91
09:29:55	62.74	29.84		32.91
09:30:00	62.74	29.97		32.78
09:30:05	62.80	29.97		32.84
09:30:10	62.87	29.97		32.90
09:30:15	62.90	30.00		32.90
09:30:20	62.99	30.09		32.90
09:30:25	62.99	30.09		32.90

Table 11 (continued)

09:30:30	63.06	30.22		32.83
09:30:35	63.04	30.08		32.96
09:30:40	63.18	30.22		32.96
09:30:45	63.24	30.22		33.02
09:30:50	63.24	30.29		32.96
09:30:55	63.31	30.22		33.08
09:31:00	63.37	30.35		33.02
09:31:05	63.43	30.35		33.08
09:31:10	63.42	30.47		32.95
09:31:15	63.48	30.40		33.08
09:31:20	63.61	30.53		33.08
09:31:25	63.62	30.55		33.07
09:31:30	63.62	30.55		33.07
09:31:35	63.68	30.55		33.14
09:31:40	63.75	30.68		33.07
09:31:45	63.75	30.68		33.07
09:31:50	63.79	30.72		33.07
09:31:55	63.87	30.74		33.13
09:32:00	63.94	30.87		33.07
09:32:05	63.94	30.80		33.13
09:32:10	64.00	30.80		33.19
09:32:15	64.06	30.93		33.13
09:32:20	64.12	30.93		33.19
09:32:25	64.19	31.00		33.19
09:32:30	64.19	31.00		33.19
09:32:35	64.25	31.06		33.19
09:32:40	64.30	31.05		33.25
09:32:45	64.31	31.13		33.18
09:32:50	64.36	31.12		33.25
09:32:55	64.44	31.06		33.37
09:33:00	64.44	31.13		33.31
09:33:05	64.50	31.26		33.24
09:33:10	64.50	31.19		33.31
09:33:15	64.55	31.25		33.31
09:33:20	64.63	31.26		33.37
09:33:25	64.62	31.25		33.37
09:33:30	64.75	31.32		33.43
09:33:35	64.75	31.32		33.43
09:33:40	64.74	31.37		33.37
09:33:45	64.80	31.51		33.30
09:33:50	64.88	31.45		33.43
09:33:55	64.88	31.58		33.30
09:34:00	64.93	31.63		33.30
09:34:05	64.94	31.58		33.36
09:34:10	65.00	31.64		33.36

Table 11 (continued)

09:34:15	65.07	31.71		33.36
09:34:20	65.13	31.64		33.49
09:34:25	65.13	31.71		33.42
09:34:30	65.18	31.83		33.35
09:34:35	65.18	31.76		33.42
09:34:40	65.17	31.75		33.42
09:34:45	65.25	31.84		33.42
09:34:50	65.32	31.90		33.42
09:34:55	65.38	31.84		33.54
09:35:00	65.43	32.02		33.41
09:35:05	65.44	31.97		33.48
09:35:10	65.43	32.02		33.41
09:35:15	65.51	31.97		33.54
09:35:20	65.56	32.02		33.54
09:35:25	65.63	32.03		33.60
09:35:30	65.69	32.16		33.53
09:35:35	65.63	32.23		33.41
09:35:40	65.69	32.16		33.53
09:35:45	65.76	32.16		33.60
09:35:50	65.76	32.23		33.53
09:35:55	65.82	32.29		33.53
09:36:00	65.86	32.20		33.66
09:36:05	65.93	32.27		33.66
09:36:10	65.95	32.35		33.59
09:36:15	65.94	32.34		33.59
09:36:20	66.00	32.41		33.59
09:36:25	66.01	32.42		33.59
09:36:30	66.13	32.42		33.72
09:36:35	66.13	32.55		33.59
09:36:40	66.12	32.53		33.59
09:36:45	66.20	32.55		33.65
09:36:50	66.25	32.67		33.58
09:36:55	66.26	32.61		33.65
09:37:00	66.31	32.67		33.64
09:37:05	66.32	32.55		33.77
09:37:10	66.39	32.61		33.77
09:37:15	66.44	32.67		33.77
09:37:20	66.51	32.68		33.83
09:37:25	66.50	32.79		33.71
09:37:30	66.57	32.81		33.77
09:37:35	66.57	32.81		33.77
09:37:40	66.63	32.86		33.77
09:37:45	66.64	32.94		33.70
09:37:50	66.70	33.00		33.70
09:37:55	66.75	33.05		33.70

Table 11 (continued)

09:38:00	66.76	32.94		33.83
09:38:05	66.83	33.00		33.83
09:38:10	66.89	32.94		33.95
09:38:15	66.94	33.05		33.89
09:38:20	66.89	33.06		33.82
09:38:25	66.95	33.06		33.89
09:38:30	66.95	33.13		33.82
09:38:35	67.01	33.19		33.82
09:38:40	67.07	33.18		33.88
09:38:45	67.08	33.26		33.82
09:38:50	67.13	33.18		33.95
09:38:55	67.20	33.26		33.94
09:39:00	67.20	33.32		33.88
09:39:05	67.25	33.25		34.01
09:39:10	67.32	33.25		34.07
09:39:15	67.33	33.32		34.01
09:39:20	67.39	33.32		34.07
09:39:25	67.39	33.32		34.07
09:39:30	67.45	33.39		34.07
09:39:35	67.45	33.45		34.00
09:39:40	67.52	33.45		34.06
09:39:45	67.52	33.45		34.06
09:39:50	67.58	33.45		34.13
09:39:55	67.57	33.57		34.00
09:40:00	67.58	33.65		33.93
09:40:05	67.64	33.65		34.00
09:40:10	67.64	33.58		34.06
09:40:15	67.69	33.57		34.12
09:40:20	67.71	33.71		34.00
09:40:25	67.76	33.77		33.99
09:40:30	67.77	33.78		33.99
09:40:35	67.76	33.77		33.99
09:40:40	67.80	33.68		34.12
09:40:45	67.83	33.78		34.06
09:40:50	67.89	33.71		34.18
09:40:55	67.89	33.84		34.05
09:41:00	67.95	33.77		34.18
09:41:05	67.95	33.83		34.12
09:41:10	68.01	33.77		34.24
09:41:15	68.02	33.84		34.18
09:41:20	68.08	33.90		34.18
09:41:25	68.07	33.89		34.18
09:41:30	68.15	33.97		34.18
09:41:35	68.13	33.89		34.24
09:41:40	68.20	34.02		34.17

Table 11 (continued)

09:41:45	68.21	34.10		34.11
09:41:50	68.26	34.09		34.17
09:41:55	68.26	34.02		34.24
09:42:00	68.33	34.03		34.30
09:42:05	68.33	34.16		34.17
09:42:10	68.31	34.07		34.24
09:42:15	68.39	34.09		34.30
09:42:20	68.38	34.21		34.17
09:42:25	68.46	34.23		34.23
09:42:30	68.45	34.28		34.17
09:42:35	68.46	34.29		34.17
09:42:40	68.52	34.42		34.10
09:42:45	68.52	34.42		34.10
09:42:50	68.57	34.35		34.23
09:42:55	68.59	34.42		34.16
09:43:00	68.59	34.42		34.16
09:43:05	68.65	34.42		34.23
09:43:10	68.65	34.42		34.23
09:43:15	68.65	34.42		34.23
09:43:20	68.65	34.49		34.16
09:43:25	68.71	34.49		34.23
09:43:30	68.76	34.54		34.22
09:43:35	68.70	34.53		34.16
09:43:40	68.76	34.54		34.22
09:43:45	68.84	34.49		34.35
09:43:50	68.84	34.68		34.16
09:43:55	68.89	34.60		34.28
09:44:00	68.90	34.61		34.28
09:44:05	68.89	34.67		34.22
09:44:10	68.89	34.73		34.15
09:44:15	68.96	34.68		34.28
09:44:20	69.01	34.80		34.22
09:44:25	69.08	34.73		34.34
09:44:30	69.09	34.81		34.28
09:44:35	69.01	34.86		34.15
09:44:40	69.08	34.80		34.28
09:44:45	69.15	34.87		34.28
09:44:50	69.20	34.80		34.40
09:44:55	69.14	34.99		34.15
09:45:00	69.15	35.00		34.15
09:45:05	69.21	35.00		34.21
09:45:10	69.21	35.00		34.21
09:45:15	69.20	35.06		34.15
09:45:20	69.28	35.07		34.21

APPENDIX D

EPOXY/GLASS COMPOSITE (PARALLEL TO LAYERS) THERMAL CONDUCTIVITY DATA

Table 12: Test Data for Uncured and 100°C Cured Epoxy/Glass Composite (Parallel to Layers)

Time	Ch 0	Ch 1	Temp	Time	Ch 2	Ch 3	Temp
	Top	Bottom	Diff °C		Bottom	Top	Diff °C
	uncured	uncured	uncured		EGC 100	EGC 100	EGC 100
11:44:45	21.83	25.12	3.29	11:14:50	23.72	21.65	2.07
11:44:50	21.89	25.19	3.29	11:14:55	23.71	21.64	2.07
11:44:55	21.82	25.69	3.87	11:15:00	24.09	21.64	2.45
11:45:00	21.89	26.48	4.58	11:15:05	25.14	21.72	3.42
11:45:05	21.89	27.19	5.30	11:15:10	26.23	21.77	4.46
11:45:10	21.95	28.02	6.07	11:15:15	27.33	21.78	5.55
11:45:15	21.95	28.79	6.84	11:15:20	28.36	21.77	6.59
11:45:20	21.96	29.51	7.56	11:15:25	29.27	21.78	7.49
11:45:25	22.01	30.28	8.27	11:15:30	30.24	21.78	8.46
11:45:30	21.96	30.93	8.98	11:15:35	31.14	21.84	9.30
11:45:35	22.09	31.58	9.49	11:15:40	31.85	21.84	10.01
11:45:40	22.09	32.23	10.14	11:15:45	32.62	21.83	10.78
11:45:45	22.01	32.80	10.78	11:15:50	33.34	21.84	11.49
11:45:50	22.09	33.32	11.24	11:15:55	33.98	21.84	12.14
11:45:55	22.09	33.90	11.82	11:16:00	34.60	21.88	12.72
11:46:00	22.15	34.42	12.27	11:16:05	35.20	21.89	13.30
11:46:05	22.15	34.94	12.79	11:16:10	35.79	21.91	13.88
11:46:10	22.15	35.45	13.30	11:16:15	36.37	21.91	14.46
11:46:15	22.15	35.91	13.75	11:16:20	36.89	21.97	14.92
11:46:20	22.22	36.36	14.14	11:16:25	37.38	21.95	15.43
11:46:25	22.28	36.87	14.59	11:16:30	37.90	21.95	15.95
11:46:30	22.21	37.32	15.11	11:16:35	38.28	21.95	16.34
11:46:35	22.27	37.70	15.43	11:16:40	38.81	22.02	16.79
11:46:40	22.26	38.15	15.89	11:16:45	39.26	22.02	17.24
11:46:45	22.27	38.48	16.21	11:16:50	39.72	22.02	17.69
11:46:50	22.34	38.87	16.53	11:16:55	40.17	22.09	18.08

Table 12 (continued)

11:46:55	22.35	39.26		16.92	11:17:00	40.55	22.09	18.47
11:47:00	22.35	39.59		17.24	11:17:05	40.94	22.09	18.86
11:47:05	22.35	39.97		17.63	11:17:10	41.33	22.09	19.24
11:47:10	22.40	40.22		17.82	11:17:15	41.65	22.15	19.50
11:47:15	22.40	40.61		18.21	11:17:20	41.99	22.17	19.82
11:47:20	22.41	40.94		18.53	11:17:25	42.36	22.09	20.28
11:47:25	22.46	41.26		18.79	11:17:30	42.68	22.14	20.53
11:47:30	22.47	41.59		19.11	11:17:35	42.75	22.22	20.53
11:47:35	22.53	41.90		19.37	11:17:40	43.07	22.22	20.86
11:47:40	22.54	42.17		19.63	11:17:45	43.46	22.28	21.18
11:47:45	22.59	42.48		19.89	11:17:50	43.78	22.28	21.50
11:47:50	22.60	42.69		20.08	11:17:55	44.03	22.27	21.76
11:47:55	22.60	43.01		20.41	11:18:00	44.36	22.28	22.08
11:48:00	22.60	43.27		20.66	11:18:05	44.69	22.28	22.41
11:48:05	22.67	43.53		20.86	11:18:10	44.88	22.34	22.54
11:48:10	22.72	43.84		21.11	11:18:15	45.20	22.41	22.79
11:48:15	22.71	44.02		21.31	11:18:20	45.46	22.41	23.05
11:48:20	22.73	44.30		21.57	11:18:25	45.72	22.41	23.31
11:48:25	22.73	44.49		21.76	11:18:30	46.04	22.41	23.63
11:48:30	22.79	44.74		21.95	11:18:35	44.56	22.47	22.08
11:48:35	22.86	45.08		22.21	11:18:40	43.19	22.53	20.66
11:48:40	22.85	45.19		22.34	11:18:45	46.32	22.55	23.76
11:48:45	22.86	45.53		22.67	11:18:50	46.69	22.54	24.15
11:48:50	22.93	45.72		22.79	11:18:55	47.01	22.60	24.41
11:48:55	22.92	45.90		22.99	11:19:00	47.27	22.67	24.60
11:49:00	22.99	46.17		23.18	11:19:05	47.46	22.67	24.80
11:49:05	22.99	46.37		23.38	11:19:10	47.72	22.67	25.05
11:49:10	23.12	46.50		23.38	11:19:15	47.92	22.73	25.18
11:49:15	23.11	46.74		23.63	11:19:20	48.16	22.72	25.44
11:49:20	23.11	46.94		23.83	11:19:25	48.37	22.73	25.64
11:49:25	23.17	47.19		24.02	11:19:30	48.55	22.72	25.83
11:49:30	23.18	47.40		24.22	11:19:35	48.76	22.80	25.96
11:49:35	23.31	47.53		24.22	11:19:40	48.95	22.86	26.09
11:49:40	23.31	47.72		24.41	11:19:45	49.14	22.93	26.22
11:49:45	23.30	47.91		24.60	11:19:50	49.34	22.93	26.41
11:49:50	23.37	48.10		24.73	11:19:55	49.53	22.99	26.54
11:49:55	23.43	48.23		24.80	11:20:00	49.71	23.05	26.67
11:50:00	23.51	48.43		24.93	11:20:05	49.97	23.05	26.93
11:50:05	23.51	48.63		25.12	11:20:10	50.11	23.12	26.99
11:50:10	23.57	48.82		25.25	11:20:15	50.31	23.18	27.12
11:50:15	23.57	49.01		25.44	11:20:20	50.43	23.18	27.25
11:50:20	23.64	49.14		25.51	11:20:25	50.63	23.18	27.44
11:50:25	23.64	49.27		25.64	11:20:30	50.88	23.24	27.64
11:50:30	23.77	49.47		25.70	11:20:35	51.00	23.30	27.70
11:50:35	23.76	49.59		25.83	11:20:40	51.13	23.30	27.83

Table 12 (continued)

11:50:40	23.83	49.85	26.02	11:20:45	51.27	23.44	27.83
11:50:45	23.82	49.91	26.09	11:20:50	51.47	23.51	27.96
11:50:50	23.89	50.04	26.15	11:20:55	51.60	23.51	28.09
11:50:55	23.96	50.31	26.35	11:21:00	51.73	23.57	28.15
11:51:00	23.96	50.44	26.48	11:21:05	51.92	23.64	28.28
11:51:05	24.02	50.56	26.54	11:21:10	52.05	23.64	28.41
11:51:10	24.09	50.69	26.60	11:21:15	52.24	23.70	28.54
11:51:15	24.08	50.81	26.73	11:21:20	52.37	23.77	28.61
11:51:20	24.21	51.01	26.80	11:21:25	52.55	23.82	28.73
11:51:25	24.22	51.15	26.93	11:21:30	52.69	23.83	28.86
11:51:30	24.28	51.27	26.99	11:21:35	52.81	23.89	28.92
11:51:35	24.35	51.40	27.06	11:21:40	52.94	23.89	29.04
11:51:40	24.41	51.60	27.19	11:21:45	53.00	23.96	29.04
11:51:45	24.41	51.73	27.31	11:21:50	53.17	24.01	29.17
11:51:50	24.48	51.86	27.38	11:21:55	53.32	24.09	29.23
11:51:55	24.54	51.98	27.44	11:22:00	53.43	24.14	29.29
11:52:00	24.61	52.11	27.51	11:22:05	53.60	24.19	29.41
11:52:05	24.67	52.24	27.57	11:22:10	53.74	24.20	29.54
11:52:10	24.67	52.31	27.64	11:22:15	53.86	24.27	29.60
11:52:15	24.73	52.44	27.70	11:22:20	53.99	24.33	29.66
11:52:20	24.80	52.56	27.76	11:22:25	54.05	24.33	29.72
11:52:25	24.88	52.70	27.82	11:22:30	54.24	24.46	29.78
11:52:30	24.92	52.80	27.88	11:22:35	54.29	24.51	29.78
11:52:35	24.99	52.94	27.95	11:22:40	54.43	24.52	29.91
11:52:40	25.06	53.06	28.01	11:22:45	54.55	24.58	29.97
11:52:45	25.11	53.24	28.13	11:22:50	54.74	24.72	30.03
11:52:50	25.19	53.32	28.13	11:22:55	54.81	24.72	30.09
11:52:55	25.25	53.44	28.19	11:23:00	54.93	24.72	30.22
11:53:00	25.25	53.57	28.32	11:23:05	55.06	24.78	30.28
11:53:05	25.32	53.63	28.31	11:23:10	55.18	24.85	30.34
11:53:10	25.38	53.76	28.38	11:23:15	55.25	24.98	30.27
11:53:15	25.45	53.88	28.44	11:23:20	55.36	24.97	30.40
11:53:20	25.45	54.01	28.56	11:23:25	55.50	25.04	30.46
11:53:25	25.57	54.07	28.50	11:23:30	55.56	25.04	30.52
11:53:30	25.56	54.18	28.62	11:23:35	55.69	25.11	30.58
11:53:35	25.69	54.25	28.55	11:23:40	55.81	25.23	30.58
11:53:40	25.77	54.38	28.62	11:23:45	55.94	25.30	30.64
11:53:45	25.77	54.51	28.74	11:23:50	55.99	25.35	30.64
11:53:50	25.83	54.57	28.74	11:23:55	56.13	25.43	30.70
11:53:55	25.85	54.65	28.80	11:24:00	56.19	25.49	30.70
11:54:00	25.90	54.76	28.86	11:24:05	56.38	25.49	30.89
11:54:05	26.02	54.88	28.86	11:24:10	56.44	25.49	30.95
11:54:10	26.03	55.01	28.99	11:24:15	56.57	25.62	30.94
11:54:15	26.16	55.08	28.92	11:24:20	56.62	25.68	30.94
11:54:20	26.17	55.22	29.05	11:24:25	56.67	25.72	30.94

Table 12 (continued)

11:54:25	26.22	55.33	29.11	11:24:30	56.80	25.80	31.00
11:54:30	26.28	55.39	29.10	11:24:35	56.88	25.82	31.07
11:54:35	26.28	55.45	29.17	11:24:40	57.01	25.88	31.13
11:54:40	26.41	55.58	29.16	11:24:45	57.13	25.88	31.25
11:54:45	26.48	55.70	29.23	11:24:50	57.18	26.00	31.19
11:54:50	26.48	55.77	29.29	11:24:55	57.32	26.07	31.25
11:54:55	26.60	55.88	29.28	11:25:00	57.36	26.05	31.31
11:55:00	26.67	55.95	29.28	11:25:05	57.51	26.20	31.31
11:55:05	26.73	56.01	29.28	11:25:10	57.57	26.20	31.37
11:55:10	26.67	56.08	29.41	11:25:15	57.70	26.40	31.30
11:55:15	26.80	56.21	29.41	11:25:20	57.70	26.33	31.37
11:55:20	26.80	56.33	29.53	11:25:25	57.81	26.38	31.43
11:55:25	26.94	56.40	29.46	11:25:30	57.88	26.39	31.49
11:55:30	26.93	56.52	29.59	11:25:35	58.07	26.46	31.61
11:55:35	26.99	56.58	29.59	11:25:40	58.05	26.56	31.48
11:55:40	27.06	56.71	29.65	11:25:45	58.20	26.59	31.61
11:55:45	27.12	56.71	29.58	11:25:50	58.26	26.65	31.61
11:55:50	27.27	56.79	29.52	11:25:55	58.38	26.77	31.60
11:55:55	27.27	56.91	29.64	11:26:00	58.44	26.83	31.60
11:56:00	27.33	56.98	29.64	11:26:05	58.51	26.91	31.60
11:56:05	27.37	57.08	29.70	11:26:10	58.57	26.90	31.66
11:56:10	27.45	57.15	29.70	11:26:15	58.69	26.97	31.72
11:56:15	27.52	57.28	29.76	11:26:20	58.82	27.03	31.79
11:56:20	27.58	57.34	29.76	11:26:25	58.88	27.10	31.78
11:56:25	27.66	57.42	29.76	11:26:30	58.94	27.16	31.78
11:56:30	27.71	57.47	29.76	11:26:35	59.00	27.22	31.78
11:56:35	27.71	57.53	29.82	11:26:40	59.05	27.27	31.78
11:56:40	27.72	57.66	29.94	11:26:45	59.14	27.37	31.78
11:56:45	27.83	57.71	29.88	11:26:50	59.25	27.41	31.84
11:56:50	27.85	57.86	30.01	11:26:55	59.32	27.48	31.84
11:56:55	27.98	57.86	29.88	11:27:00	59.37	27.53	31.84
11:57:00	28.03	57.97	29.94	11:27:05	59.49	27.60	31.90
11:57:05	28.09	57.97	29.87	11:27:10	59.57	27.54	32.02
11:57:10	28.15	58.02	29.87	11:27:15	59.58	27.69	31.89
11:57:15	28.16	58.15	30.00	11:27:20	59.69	27.61	32.09
11:57:20	28.21	58.27	30.06	11:27:25	59.82	27.81	32.02
11:57:25	28.28	58.27	29.99	11:27:30	59.82	27.74	32.08
11:57:30	28.35	58.47	30.12	11:27:35	59.93	27.86	32.08
11:57:35	28.35	58.47	30.12	11:27:40	59.94	27.99	31.95
11:57:40	28.48	58.53	30.05	11:27:45	60.07	27.99	32.08
11:57:45	28.48	58.59	30.11	11:27:50	60.12	28.05	32.07
11:57:50	28.54	58.66	30.11	11:27:55	60.18	28.05	32.14
11:57:55	28.61	58.78	30.17	11:28:00	60.32	28.19	32.13
11:58:00	28.61	58.78	30.17	11:28:05	60.38	28.25	32.13
11:58:05	28.73	58.83	30.11	11:28:10	60.38	28.25	32.13

Table 12 (continued)

11:58:10	28.74	58.97		30.23	11:28:15	60.50	28.18		32.32
11:58:15	28.87	59.03		30.17	11:28:20	60.51	28.32		32.19
11:58:20	28.86	59.09		30.23	11:28:25	60.62	28.37		32.25
11:58:25	28.99	59.21		30.23	11:28:30	60.69	28.37		32.32
11:58:30	29.06	59.22		30.16	11:28:35	60.76	28.58		32.19
11:58:35	29.00	59.29		30.29	11:28:40	60.82	28.58		32.25
11:58:40	29.13	59.35		30.22	11:28:45	60.89	28.58		32.31
11:58:45	29.13	59.41		30.29	11:28:50	60.94	28.63		32.31
11:58:50	29.25	59.54		30.28	11:28:55	61.00	28.63		32.37
11:58:55	29.24	59.59		30.34	11:29:00	61.06	28.70		32.37
11:59:00	29.31	59.59		30.28	11:29:05	61.14	28.70		32.43
11:59:05	29.38	59.66		30.28	11:29:10	61.20	28.83		32.37
11:59:10	29.45	59.79		30.34	11:29:15	61.25	28.95		32.30
11:59:15	29.50	59.84		30.34	11:29:20	61.33	28.96		32.36
11:59:20	29.57	59.90		30.34	11:29:25	61.38	28.95		32.43
11:59:25	29.58	59.98		30.40	11:29:30	61.45	29.09		32.36
11:59:30	29.64	59.98		30.33	11:29:35	61.58	29.03		32.55
11:59:35	29.63	60.09		30.46	11:29:40	61.58	29.22		32.36
11:59:40	29.70	60.09		30.39	11:29:45	61.70	29.22		32.48
11:59:45	29.76	60.22		30.46	11:29:50	61.69	29.21		32.48
11:59:50	29.77	60.29		30.52	11:29:55	61.83	29.29		32.54
11:59:55	29.89	60.28		30.39	11:30:00	61.83	29.35		32.48
12:00:00	29.96	60.41		30.45	11:30:05	61.89	29.35		32.54
12:00:05	29.96	60.47		30.51	11:30:10	61.95	29.54		32.41
12:00:10	29.97	60.54		30.58	11:30:15	62.01	29.53		32.47
12:00:15	30.08	60.59		30.51	11:30:20	62.14	29.67		32.47
12:00:20	30.08	60.59		30.51	11:30:25	62.14	29.61		32.53
12:00:25	30.22	60.67		30.44	11:30:30	62.16	29.63		32.53
12:00:30	30.22	60.73		30.51	11:30:35	62.26	29.66		32.59
12:00:35	30.21	60.78		30.57	11:30:40	62.26	29.79		32.47
12:00:40	30.42	60.86		30.44	11:30:45	62.38	29.92		32.46
12:00:45	30.35	60.86		30.50	11:30:50	62.41	29.95		32.46
12:00:50	30.41	60.97		30.56	11:30:55	62.46	29.93		32.53
12:00:55	30.47	61.03		30.56	11:31:00	62.60	30.01		32.59
12:01:00	30.55	61.11		30.56	11:31:05	62.60	30.08		32.52
12:01:05	30.61	61.17		30.56	11:31:10	62.64	29.99		32.65
12:01:10	30.48	61.17		30.69	11:31:15	62.72	30.21		32.52
12:01:15	30.67	61.29		30.62	11:31:20	62.79	30.34		32.45
12:01:20	30.74	61.36		30.62	11:31:25	62.85	30.27		32.58
12:01:25	30.68	61.36		30.68	11:31:30	62.91	30.34		32.58
12:01:30	30.68	61.42		30.75	11:31:35	62.97	30.33		32.64
12:01:35	30.74	61.48		30.74	11:31:40	62.97	30.39		32.58
12:01:40	30.86	61.47		30.61	11:31:45	63.03	30.33		32.70
12:01:45	30.93	61.61		30.68	11:31:50	63.14	30.57		32.57
12:01:50	30.92	61.66		30.74	11:31:55	63.16	30.59		32.57

Table 12 (continued)

12:01:55	31.08	61.69		30.61	11:32:00	63.23	30.59		32.63
12:02:00	31.06	61.74		30.67	11:32:05	63.29	30.66		32.63
12:02:05	31.05	61.73		30.67	11:32:10	63.29	30.72		32.57
12:02:10	31.19	61.86		30.67	11:32:15	63.35	30.72		32.63
12:02:15	31.25	61.85		30.60	11:32:20	63.42	30.72		32.69
12:02:20	31.26	61.99		30.73	11:32:25	63.48	30.85		32.63
12:02:25	31.27	62.07		30.79	11:32:30	63.54	30.79		32.75
12:02:30	31.34	62.07		30.73	11:32:35	63.60	30.85		32.75
12:02:35	31.40	62.13		30.73	11:32:40	63.67	30.85		32.82
12:02:40	31.40	62.19		30.79	11:32:45	63.67	30.92		32.75
12:02:45	31.52	62.24		30.72	11:32:50	63.72	30.97		32.75
12:02:50	31.52	62.24		30.72	11:32:55	63.85	31.04		32.81
12:02:55	31.60	62.25		30.66	11:33:00	63.86	31.05		32.81
12:03:00	31.59	62.37		30.78	11:33:05	63.91	31.17		32.74
12:03:05	31.73	62.44		30.72	11:33:10	63.92	31.30		32.61
12:03:10	31.79	62.44		30.65	11:33:15	63.98	31.37		32.61
12:03:15	31.79	62.51		30.72	11:33:20	64.04	31.30		32.74
12:03:20	31.79	62.57		30.78	11:33:25	64.11	31.43		32.67
12:03:25	31.91	62.62		30.71	11:33:30	64.10	31.42		32.67
12:03:30	31.97	62.68		30.71	11:33:35	64.16	31.42		32.74
12:03:35	31.98	62.69		30.71	11:33:40	64.23	31.50		32.73
12:03:40	31.98	62.76		30.77	11:33:45	64.30	31.56		32.73
12:03:45	32.05	62.82		30.77	11:33:50	64.30	31.50		32.80
12:03:50	32.11	62.88		30.77	11:33:55	64.41	31.55		32.86
12:03:55	32.11	62.95		30.83	11:34:00	64.42	31.50		32.92
12:04:00	32.10	63.00		30.90	11:34:05	64.48	31.69		32.79
12:04:05	32.18	62.95		30.77	11:34:10	64.55	31.69		32.86
12:04:10	32.18	63.01		30.83	11:34:15	64.61	31.69		32.92
12:04:15	32.26	63.15		30.89	11:34:20	64.61	31.82		32.79
12:04:20	32.39	63.15		30.76	11:34:25	64.67	31.95		32.72
12:04:25	32.38	63.20		30.83	11:34:30	64.74	31.95		32.79
12:04:30	32.44	63.27		30.82	11:34:35	64.74	32.01		32.72
12:04:35	32.44	63.27		30.82	11:34:40	64.79	32.00		32.78
12:04:40	32.45	63.34		30.89	11:34:45	64.80	32.01		32.78
12:04:45	32.52	63.40		30.89	11:34:50	64.91	32.00		32.91
12:04:50	32.57	63.39		30.82	11:34:55	64.92	32.14		32.78
12:04:55	32.59	63.47		30.88	11:35:00	64.98	32.13		32.84
12:05:00	32.60	63.48		30.88	11:35:05	64.99	32.27		32.71
12:05:05	32.70	63.52		30.82	11:35:10	65.11	32.27		32.84
12:05:10	32.79	63.61		30.82	11:35:15	65.10	32.33		32.77
12:05:15	32.86	63.67		30.81					
12:05:20	32.98	63.73		30.75					
12:05:25	32.92	63.73		30.81					
12:05:30	32.91	63.78		30.87					

Table 13: Test Data for 200°C and 250°C Cured Epoxy/Glass Composite (Parallel to Layers)

Time	Ch 0	Ch 1	Temp	Time	Ch 0	Ch 1	Temp
	Top	Bottom	Diff °C		Top	Bottom	Diff °C
	EGC 200	EGC 200	EGC 200		EGC 250	EGC 250	EGC 250
11:14:50	21.91	23.33	1.42	10:42:15	22.04	23.33	1.29
11:14:55	21.90	23.38	1.49	10:42:20	22.04	23.33	1.29
11:15:00	21.90	23.45	1.55	10:42:25	22.04	23.52	1.49
11:15:05	21.97	23.85	1.87	10:42:30	22.04	24.30	2.26
11:15:10	21.96	24.42	2.45	10:42:35	22.03	25.13	3.10
11:15:15	21.97	24.94	2.97	10:42:40	22.10	26.04	3.94
11:15:20	22.03	25.58	3.55	10:42:45	22.03	26.87	4.84
11:15:25	22.04	26.17	4.13	10:42:50	22.04	27.78	5.75
11:15:30	22.10	26.82	4.71	10:42:55	22.10	28.43	6.33
11:15:35	22.10	27.40	5.30	10:43:00	21.84	26.88	5.04
11:15:40	22.10	27.98	5.88	10:43:05	22.04	28.49	6.46
11:15:45	22.09	28.55	6.46	10:43:10	22.10	29.27	7.17
11:15:50	22.17	29.14	6.97	10:43:15	22.36	30.88	8.52
11:15:55	22.17	29.72	7.56	10:43:20	22.30	30.69	8.39
11:16:00	22.14	30.15	8.01	10:43:25	22.23	32.95	10.72
11:16:05	22.15	30.67	8.52	10:43:30	22.23	33.60	11.37
11:16:10	22.23	31.21	8.98	10:43:35	22.23	34.24	12.01
11:16:15	22.23	31.72	9.49	10:43:40	22.23	34.69	12.46
11:16:20	22.30	32.11	9.82	10:43:45	22.23	35.21	12.98
11:16:25	22.21	32.60	10.40	10:43:50	22.29	35.72	13.43
11:16:30	22.27	32.99	10.72	10:43:55	22.36	36.18	13.82
11:16:35	22.27	33.51	11.24	10:44:00	22.36	36.63	14.27
11:16:40	22.34	33.90	11.56	10:44:05	22.36	37.02	14.66
11:16:45	22.34	34.29	11.95	10:44:10	22.35	37.46	15.11
11:16:50	22.34	35.00	12.66	10:44:15	22.42	37.86	15.43
11:16:55	22.22	36.74	14.53	10:44:20	22.42	38.31	15.89
11:17:00	22.28	37.26	14.98	10:44:25	22.42	38.63	16.21
11:17:05	22.34	37.71	15.37	10:44:30	22.42	39.02	16.60
11:17:10	22.41	38.23	15.82	10:44:35	22.49	39.34	16.85
11:17:15	22.41	38.55	16.14	10:44:40	22.49	39.67	17.18
11:17:20	22.49	38.96	16.47	10:44:45	22.48	40.04	17.56
11:17:25	22.47	39.33	16.85	10:44:50	22.48	40.37	17.89
11:17:30	22.27	39.77	17.50	10:44:55	22.48	40.69	18.21
11:17:35	22.47	38.75	16.27	10:45:00	22.55	41.02	18.47
11:17:40	22.47	38.17	15.69	10:45:05	22.62	39.73	17.11
11:17:45	22.54	40.55	18.02	10:45:10	22.67	39.33	16.66
11:17:50	22.54	41.07	18.53	10:45:15	22.68	41.80	19.11
11:17:55	22.53	41.45	18.92	10:45:20	22.68	42.18	19.50
11:18:00	22.60	41.78	19.18	10:45:25	22.74	42.56	19.82
11:18:05	22.60	42.10	19.50	10:45:30	22.68	42.83	20.15

Table 13 (continued)

11:18:10	22.67	42.36	19.70	10:45:35	22.68	43.09	20.41
11:18:15	22.67	42.62	19.95	10:45:40	22.75	43.41	20.66
11:18:20	22.73	42.88	20.15	10:45:45	22.74	43.72	20.99
11:18:25	22.73	43.14	20.41	10:45:50	22.80	43.91	21.12
11:18:30	22.80	43.33	20.53	10:45:55	22.86	44.17	21.31
11:18:35	22.80	43.59	20.79	10:46:00	22.86	44.43	21.57
11:18:40	22.85	43.84	20.99	10:46:05	22.86	44.62	21.76
11:18:45	22.94	44.06	21.12	10:46:10	22.93	44.88	21.96
11:18:50	22.93	44.30	21.37	10:46:15	22.93	45.07	22.15
11:18:55	22.93	44.56	21.63	10:46:20	22.99	45.33	22.34
11:19:00	22.99	44.75	21.76	10:46:25	22.99	45.59	22.60
11:19:05	22.99	44.95	21.96	10:46:30	22.99	45.72	22.73
11:19:10	22.99	45.20	22.21	10:46:35	23.05	46.04	22.99
11:19:15	23.06	45.40	22.34	10:46:40	23.05	46.17	23.12
11:19:20	23.11	45.58	22.47	10:46:45	23.12	46.43	23.31
11:19:25	23.12	45.79	22.67	10:46:50	23.12	46.62	23.50
11:19:30	23.17	45.97	22.79	10:46:55	23.12	46.82	23.70
11:19:35	23.18	46.24	23.05	10:47:00	23.17	47.00	23.83
11:19:40	23.25	46.37	23.12	10:47:05	23.25	47.21	23.96
11:19:45	23.25	46.56	23.31	10:47:10	23.33	47.42	24.09
11:19:50	23.31	46.75	23.44	10:47:15	23.33	47.61	24.28
11:19:55	23.38	46.95	23.57	10:47:20	23.38	47.79	24.41
11:20:00	23.37	47.13	23.76	10:47:25	23.38	47.98	24.60
11:20:05	23.43	47.32	23.89	10:47:30	23.44	48.17	24.73
11:20:10	23.51	47.53	24.02	10:47:35	23.44	48.30	24.86
11:20:15	23.51	47.66	24.15	10:47:40	23.50	48.49	24.99
11:20:20	23.57	47.92	24.34	10:47:45	23.57	48.69	25.12
11:20:25	23.64	47.98	24.34	10:47:50	23.64	48.82	25.18
11:20:30	23.63	48.16	24.54	10:47:55	23.69	49.00	25.31
11:20:35	23.69	48.36	24.67	10:48:00	23.70	49.14	25.44
11:20:40	23.69	48.55	24.86	10:48:05	23.70	49.34	25.64
11:20:45	23.77	48.69	24.93	10:48:10	23.83	49.47	25.64
11:20:50	23.83	48.88	25.05	10:48:15	23.83	49.66	25.83
11:20:55	23.89	49.01	25.12	10:48:20	23.96	49.79	25.83
11:21:00	23.96	49.14	25.18	10:48:25	23.96	49.98	26.02
11:21:05	23.96	49.34	25.38	10:48:30	24.02	50.18	26.15
11:21:10	24.02	49.47	25.44	10:48:35	24.02	50.24	26.22
11:21:15	24.09	49.66	25.57	10:48:40	24.15	50.43	26.28
11:21:20	24.15	49.79	25.64	10:48:45	24.15	50.56	26.41
11:21:25	24.21	49.91	25.70	10:48:50	24.28	50.69	26.41
11:21:30	24.22	50.05	25.83	10:48:55	24.28	50.82	26.54
11:21:35	24.28	50.18	25.89	10:49:00	24.28	51.01	26.73
11:21:40	24.35	50.31	25.96	10:49:05	24.41	51.14	26.73
11:21:45	24.41	50.50	26.09	10:49:10	24.41	51.27	26.86
11:21:50	24.46	50.61	26.15	10:49:15	24.48	51.40	26.93

Table 13 (continued)

11:21:55	24.54	50.76	26.22	10:49:20	24.54	51.53	26.99
11:22:00	24.60	50.88	26.28	10:49:25	24.54	51.73	27.19
11:22:05	24.64	50.99	26.35	10:49:30	24.60	51.79	27.19
11:22:10	24.65	51.13	26.48	10:49:35	24.67	51.92	27.25
11:22:15	24.72	51.26	26.54	10:49:40	24.73	52.11	27.38
11:22:20	24.78	51.39	26.60	10:49:45	24.73	52.18	27.44
11:22:25	24.85	51.52	26.67	10:49:50	24.86	52.37	27.51
11:22:30	24.91	51.65	26.73	10:49:55	24.93	52.43	27.51
11:22:35	24.90	51.70	26.80	10:50:00	24.99	52.56	27.57
11:22:40	24.98	51.90	26.93	10:50:05	24.99	52.75	27.76
11:22:45	25.10	51.96	26.86	10:50:10	25.12	52.87	27.75
11:22:50	25.11	52.10	26.99	10:50:15	25.11	52.93	27.82
11:22:55	25.17	52.16	26.99	10:50:20	25.19	53.06	27.88
11:23:00	25.23	52.36	27.12	10:50:25	25.27	53.20	27.94
11:23:05	25.30	52.48	27.18	10:50:30	25.33	53.27	27.94
11:23:10	25.36	52.61	27.24	10:50:35	25.38	53.44	28.06
11:23:15	25.43	52.67	27.24	10:50:40	25.38	53.50	28.12
11:23:20	25.49	52.80	27.30	10:50:45	25.51	53.63	28.12
11:23:25	25.56	52.92	27.36	10:50:50	25.52	53.71	28.18
11:23:30	25.56	52.98	27.43	10:50:55	25.59	53.83	28.24
11:23:35	25.62	53.11	27.49	10:51:00	25.65	53.96	28.30
11:23:40	25.75	53.17	27.42	10:51:05	25.71	54.01	28.30
11:23:45	25.75	53.36	27.61	10:51:10	25.78	54.21	28.43
11:23:50	25.86	53.47	27.61	10:51:15	25.90	54.32	28.42
11:23:55	25.88	53.49	27.61	10:51:20	25.90	54.39	28.49
11:24:00	25.94	53.61	27.67	10:51:25	25.98	54.46	28.48
11:24:05	26.01	53.68	27.67	10:51:30	26.11	54.59	28.48
11:24:10	26.01	53.80	27.79	10:51:35	26.11	54.71	28.61
11:24:15	26.07	53.93	27.85	10:51:40	26.16	54.76	28.60
11:24:20	26.19	54.04	27.85	10:51:45	26.23	54.90	28.67
11:24:25	26.24	54.09	27.85	10:51:50	26.23	54.96	28.73
11:24:30	26.32	54.16	27.85	10:51:55	26.30	55.09	28.79
11:24:35	26.40	54.30	27.91	10:52:00	26.36	55.15	28.79
11:24:40	26.40	54.37	27.97	10:52:05	26.43	55.28	28.85
11:24:45	26.46	54.56	28.09	10:52:10	26.49	55.34	28.85
11:24:50	26.58	54.55	27.96	10:52:15	26.56	55.47	28.91
11:24:55	26.65	54.68	28.03	10:52:20	26.69	55.59	28.91
11:25:00	26.63	54.78	28.15	10:52:25	26.68	55.64	28.97
11:25:05	26.72	54.87	28.15	10:52:30	26.81	55.71	28.90
11:25:10	26.85	54.93	28.08	10:52:35	26.82	55.84	29.03
11:25:15	26.85	55.06	28.21	10:52:40	26.88	55.91	29.03
11:25:20	26.85	55.18	28.34	10:52:45	26.95	56.03	29.09
11:25:25	26.90	55.23	28.33	10:52:50	26.95	56.10	29.15
11:25:30	27.03	55.30	28.27	10:52:55	27.07	56.16	29.08
11:25:35	27.04	55.37	28.33	10:53:00	27.07	56.28	29.21

Table 13 (continued)

11:25:40	27.08	55.47	28.39	10:53:05	27.14	56.35	29.21
11:25:45	27.17	55.56	28.39	10:53:10	27.28	56.49	29.20
11:25:50	27.24	55.69	28.45	10:53:15	27.19	56.52	29.33
11:25:55	27.29	55.74	28.45	10:53:20	27.33	56.66	29.33
11:26:00	27.35	55.80	28.45	10:53:25	27.40	56.72	29.33
11:26:05	27.43	55.88	28.45	10:53:30	27.46	56.79	29.32
11:26:10	27.48	55.99	28.51	10:53:35	27.53	56.85	29.32
11:26:15	27.55	56.05	28.50	10:53:40	27.59	56.97	29.38
11:26:20	27.61	56.18	28.57	10:53:45	27.66	57.10	29.44
11:26:25	27.68	56.24	28.56	10:53:50	27.72	57.10	29.38
11:26:30	27.67	56.30	28.63	10:53:55	27.72	57.23	29.51
11:26:35	27.80	56.36	28.56	10:54:00	27.78	57.29	29.50
11:26:40	27.86	56.48	28.62	10:54:05	27.91	57.41	29.50
11:26:45	27.88	56.57	28.68	10:54:10	27.91	57.48	29.56
11:26:50	27.93	56.61	28.68	10:54:15	28.04	57.54	29.50
11:26:55	28.00	56.68	28.68	10:54:20	28.06	57.62	29.56
11:27:00	28.05	56.79	28.74	10:54:25	28.19	57.74	29.56
11:27:05	28.11	56.85	28.74	10:54:30	28.19	57.74	29.56
11:27:10	28.20	56.93	28.72	10:54:35	28.16	57.84	29.68
11:27:15	28.20	57.01	28.80	10:54:40	28.29	57.91	29.62
11:27:20	28.25	57.05	28.80	10:54:45	28.30	57.98	29.68
11:27:25	28.32	57.18	28.86	10:54:50	28.37	58.04	29.68
11:27:30	28.38	57.18	28.80	10:54:55	28.43	58.17	29.74
11:27:35	28.37	57.29	28.92	10:55:00	28.43	58.17	29.74
11:27:40	28.58	57.37	28.79	10:55:05	28.57	58.30	29.73
11:27:45	28.58	57.43	28.85	10:55:10	28.61	58.41	29.80
11:27:50	28.63	57.48	28.85	10:55:15	28.69	58.48	29.79
11:27:55	28.70	57.55	28.85	10:55:20	28.75	58.55	29.79
11:28:00	28.77	57.62	28.85	10:55:25	28.77	58.62	29.85
11:28:05	28.83	57.74	28.91	10:55:30	28.82	58.67	29.85
11:28:10	28.83	57.81	28.97	10:55:35	28.88	58.73	29.85
11:28:15	28.89	57.86	28.97	10:55:40	28.95	58.80	29.85
11:28:20	29.03	57.93	28.91	10:55:45	29.01	58.86	29.85
11:28:25	29.02	57.99	28.97	10:55:50	29.08	58.99	29.91
11:28:30	29.08	58.05	28.97	10:55:55	29.14	58.99	29.84
11:28:35	29.16	58.12	28.96	10:56:00	29.21	59.11	29.91
11:28:40	29.16	58.18	29.03	10:56:05	29.14	59.11	29.97
11:28:45	29.29	58.25	28.96	10:56:10	29.27	59.24	29.97
11:28:50	29.28	58.36	29.09	10:56:15	29.33	59.30	29.97
11:28:55	29.34	58.36	29.02	10:56:20	29.33	59.36	30.03
11:29:00	29.34	58.43	29.08	10:56:25	29.39	59.41	30.03
11:29:05	29.42	58.50	29.08	10:56:30	29.44	59.46	30.02
11:29:10	29.48	58.62	29.14	10:56:35	29.58	59.60	30.02
11:29:15	29.47	58.68	29.21	10:56:40	29.66	59.61	29.96
11:29:20	29.54	58.69	29.14	10:56:45	29.66	59.68	30.02

Table 13 (continued)

11:29:25	29.53	58.80	29.27	10:56:50	29.72	59.74	30.02
11:29:30	29.74	58.88	29.14	10:56:55	29.77	59.79	30.02
11:29:35	29.67	58.94	29.27	10:57:00	29.79	59.93	30.14
11:29:40	29.67	58.94	29.27	10:57:05	29.82	59.90	30.08
11:29:45	29.80	59.06	29.26	10:57:10	29.90	60.04	30.14
11:29:50	29.86	59.12	29.26	10:57:15	29.95	60.09	30.14
11:29:55	29.87	59.19	29.32	10:57:20	30.03	60.23	30.20
11:30:00	30.00	59.19	29.19	10:57:25	30.08	60.22	30.13
11:30:05	30.00	59.25	29.26	10:57:30	30.15	60.28	30.13
11:30:10	30.06	59.38	29.32	10:57:35	30.29	60.35	30.07
11:30:15	30.12	59.43	29.32	10:57:40	30.29	60.41	30.13
11:30:20	30.25	59.50	29.25	10:57:45	30.29	60.48	30.19
11:30:25	30.25	59.57	29.31	10:57:50	30.35	60.54	30.19
11:30:30	30.34	59.65	29.31	10:57:55	30.42	60.60	30.19
11:30:35	30.37	59.68	29.31	10:58:00	30.48	60.60	30.12
11:30:40	30.37	59.68	29.31	10:58:05	30.61	60.73	30.12
11:30:45	30.44	59.74	29.31	10:58:10	30.54	60.79	30.25
11:30:50	30.53	59.83	29.30	10:58:15	30.61	60.85	30.25
11:30:55	30.58	59.82	29.24	10:58:20	30.67	60.92	30.24
11:31:00	30.53	59.96	29.43	10:58:25	30.74	60.92	30.18
11:31:05	30.72	59.96	29.24	10:58:30	30.80	61.04	30.24
11:31:10	30.76	60.06	29.30	10:58:35	30.87	61.04	30.18
11:31:15	30.79	60.09	29.30	10:58:40	30.87	61.17	30.30
11:31:20	30.92	60.21	29.29	10:58:45	30.93	61.17	30.24
11:31:25	30.92	60.21	29.29	10:58:50	31.00	61.29	30.30
11:31:30	31.05	60.27	29.23	10:58:55	31.06	61.29	30.23
11:31:35	31.04	60.39	29.35	10:59:00	31.00	61.36	30.36
11:31:40	31.10	60.39	29.29	10:59:05	31.13	61.36	30.23
11:31:45	31.17	60.45	29.29	10:59:10	31.13	61.48	30.36
11:31:50	31.08	60.50	29.41	10:59:15	31.13	61.55	30.42
11:31:55	31.24	60.59	29.35	10:59:20	31.32	61.55	30.23
11:32:00	31.30	60.65	29.35	10:59:25	31.38	61.61	30.22
11:32:05	31.30	60.65	29.35	10:59:30	31.38	61.67	30.29
11:32:10	31.37	60.78	29.41	10:59:35	31.38	61.73	30.35
11:32:15	31.43	60.78	29.34	10:59:40	31.51	61.86	30.35
11:32:20	31.50	60.84	29.34	10:59:45	31.58	61.92	30.34
11:32:25	31.43	60.90	29.47	10:59:50	31.58	61.92	30.34
11:32:30	31.50	60.90	29.40	10:59:55	31.64	61.99	30.34
11:32:35	31.56	61.03	29.47	11:00:00	31.64	62.05	30.41
11:32:40	31.50	61.03	29.53	11:00:05	31.70	62.04	30.34
11:32:45	31.69	61.09	29.40	11:00:10	31.84	62.11	30.28
11:32:50	31.75	61.08	29.33	11:00:15	31.77	62.17	30.40
11:32:55	31.75	61.21	29.46	11:00:20	31.90	62.24	30.34
11:33:00	31.82	61.22	29.40	11:00:25	31.90	62.30	30.40
11:33:05	31.81	61.27	29.46	11:00:30	31.97	62.36	30.40

Table 13 (continued)

11:33:10	31.89	61.34	29.46	11:00:35	32.03	62.36	30.33
11:33:15	31.95	61.41	29.46	11:00:40	32.02	62.42	30.39
11:33:20	32.01	61.47	29.45	11:00:45	32.09	62.49	30.39
11:33:25	32.08	61.53	29.45	11:00:50	32.09	62.55	30.46
11:33:30	32.07	61.52	29.45	11:00:55	32.16	62.61	30.45
11:33:35	32.08	61.58	29.50	11:01:00	32.16	62.68	30.52
11:33:40	32.21	61.66	29.45	11:01:05	32.21	62.67	30.45
11:33:45	32.14	61.72	29.58	11:01:10	32.34	62.79	30.45
11:33:50	32.27	61.78	29.51	11:01:15	32.34	62.79	30.45
11:33:55	32.33	61.77	29.44	11:01:20	32.41	62.85	30.45
11:34:00	32.40	61.85	29.44	11:01:25	32.42	62.87	30.45
11:34:05	32.40	61.91	29.51	11:01:30	32.42	62.93	30.51
11:34:10	32.47	61.97	29.50	11:01:35	32.55	63.05	30.51
11:34:15	32.47	61.97	29.50	11:01:40	32.54	63.04	30.51
11:34:20	32.40	62.03	29.63	11:01:45	32.55	63.12	30.57
11:34:25	32.53	62.10	29.57	11:01:50	32.61	63.12	30.51
11:34:30	32.60	62.10	29.50	11:01:55	32.68	63.18	30.50
11:34:35	32.72	62.16	29.43	11:02:00	32.74	63.24	30.50
11:34:40	32.65	62.21	29.56	11:02:05	32.81	63.31	30.50
11:34:45	32.72	62.28	29.56	11:02:10	32.79	63.29	30.50
11:34:50	32.71	62.27	29.56	11:02:15	32.93	63.37	30.43
11:34:55	32.79	62.28	29.50	11:02:20	32.87	63.43	30.56
11:35:00	32.84	62.34	29.49	11:02:25	33.00	63.49	30.50
11:35:05	32.79	62.41	29.62	11:02:30	33.06	63.49	30.43
11:35:10	32.98	62.47	29.49	11:02:35	33.06	63.49	30.43
11:35:15	32.91	62.53	29.62	11:02:40	33.13	63.62	30.49
				11:02:45	33.19	63.62	30.43
				11:02:50	33.13	63.68	30.55
				11:02:55	33.26	63.75	30.49
				11:03:00	33.26	63.81	30.55
				11:03:05	33.26	63.81	30.55
				11:03:10	33.34	63.95	30.61
				11:03:15	33.32	63.93	30.61
				11:03:20	33.45	63.93	30.48
				11:03:25	33.51	63.99	30.48
				11:03:30	33.45	64.06	30.61
				11:03:35	33.60	64.14	30.54
				11:03:40	33.60	64.14	30.54

Table 14: Test Data for 275°C Cured Epoxy/Glass Composite (Parallel to Layers)

Time	Ch 2	Ch 3	Temp
	Bottom	Top	Diff °C
	EGC 275	EGC 275	EGC 275
10:42:15	23.65	22.04	1.61
10:42:20	23.65	22.10	1.55
10:42:25	23.97	22.04	1.94
10:42:30	24.94	22.10	2.84
10:42:35	25.97	22.09	3.87
10:42:40	27.01	22.10	4.91
10:42:45	27.97	22.03	5.94
10:42:50	28.95	22.10	6.84
10:42:55	29.72	22.10	7.62
10:43:00	30.56	22.17	8.39
10:43:05	31.47	22.23	9.23
10:43:10	32.24	22.23	10.01
10:43:15	32.95	22.17	10.78
10:43:20	33.53	22.17	11.37
10:43:25	34.18	22.17	12.01
10:43:30	34.24	22.17	12.08
10:43:35	34.76	22.23	12.53
10:43:40	35.28	22.17	13.11
10:43:45	35.79	22.30	13.50
10:43:50	36.30	22.22	14.08
10:43:55	36.82	22.30	14.53
10:44:00	37.28	22.30	14.98
10:44:05	37.73	22.30	15.43
10:44:10	38.11	22.35	15.76
10:44:15	38.50	22.36	16.14
10:44:20	38.96	22.36	16.60
10:44:25	39.34	22.36	16.98
10:44:30	39.67	22.36	17.31
10:44:35	40.05	22.42	17.63
10:44:40	40.38	22.36	18.02
10:44:45	40.75	22.48	18.27
10:44:50	41.08	22.42	18.66
10:44:55	41.33	22.48	18.85
10:45:00	41.73	22.49	19.24
10:45:05	41.99	22.55	19.44
10:45:10	42.23	22.54	19.70
10:45:15	41.28	22.55	18.73
10:45:20	40.38	22.62	17.76
10:45:25	42.43	22.61	19.82
10:45:30	42.83	22.68	20.15

Table 14 (continued)

10:45:35	43.15	22.62		20.53
10:45:40	43.41	22.68		20.73
10:45:45	43.66	22.74		20.92
10:45:50	43.98	22.73		21.24
10:45:55	44.23	22.73		21.50
10:46:00	44.49	22.86		21.63
10:46:05	44.75	22.80		21.96
10:46:10	44.94	22.86		22.08
10:46:15	45.27	22.86		22.41
10:46:20	45.40	22.93		22.47
10:46:25	45.72	22.99		22.73
10:46:30	45.91	22.99		22.92
10:46:35	46.11	23.05		23.05
10:46:40	46.30	23.12		23.18
10:46:45	46.56	23.05		23.50
10:46:50	46.75	23.18		23.57
10:46:55	46.95	23.25		23.70
10:47:00	47.13	23.24		23.89
10:47:05	47.33	23.31		24.02
10:47:10	47.54	23.39		24.15
10:47:15	47.74	23.39		24.34
10:47:20	47.92	23.44		24.47
10:47:25	48.11	23.51		24.60
10:47:30	48.24	23.57		24.67
10:47:35	48.43	23.57		24.86
10:47:40	48.62	23.63		24.99
10:47:45	48.82	23.70		25.12
10:47:50	49.01	23.70		25.31
10:47:55	49.13	23.75		25.38
10:48:00	49.34	23.89		25.44
10:48:05	49.47	23.89		25.57
10:48:10	49.66	23.96		25.70
10:48:15	49.79	24.02		25.77
10:48:20	49.92	24.02		25.89
10:48:25	50.11	24.09		26.02
10:48:30	50.30	24.15		26.15
10:48:35	50.43	24.22		26.22
10:48:40	50.56	24.28		26.28
10:48:45	50.69	24.28		26.41
10:48:50	50.89	24.41		26.48
10:48:55	51.01	24.48		26.54
10:49:00	51.14	24.48		26.67
10:49:05	51.27	24.60		26.67
10:49:10	51.40	24.60		26.80
10:49:15	51.60	24.67		26.93

Table 14 (continued)

10:49:20	51.73	24.73		26.99
10:49:25	51.85	24.73		27.12
10:49:30	51.98	24.80		27.19
10:49:35	52.11	24.86		27.25
10:49:40	52.31	24.93		27.38
10:49:45	52.37	24.99		27.38
10:49:50	52.50	24.99		27.51
10:49:55	52.62	25.12		27.50
10:50:00	52.81	25.25		27.56
10:50:05	52.81	25.25		27.56
10:50:10	53.00	25.31		27.69
10:50:15	53.05	25.43		27.62
10:50:20	53.25	25.44		27.81
10:50:25	53.33	25.52		27.81
10:50:30	53.46	25.59		27.87
10:50:35	53.57	25.70		27.86
10:50:40	53.63	25.70		27.93
10:50:45	53.82	25.77		28.05
10:50:50	53.90	25.85		28.05
10:50:55	54.02	25.91		28.11
10:51:00	54.15	25.98		28.17
10:51:05	54.26	26.03		28.23
10:51:10	54.34	26.11		28.23
10:51:15	54.38	26.15		28.23
10:51:20	54.51	26.22		28.29
10:51:25	54.65	26.30		28.35
10:51:30	54.71	26.30		28.41
10:51:35	54.84	26.43		28.41
10:51:40	54.95	26.48		28.47
10:51:45	55.03	26.56		28.47
10:51:50	55.15	26.56		28.59
10:51:55	55.28	26.62		28.66
10:52:00	55.34	26.75		28.59
10:52:05	55.40	26.75		28.65
10:52:10	55.47	26.75		28.72
10:52:15	55.59	26.95		28.65
10:52:20	55.72	26.95		28.77
10:52:25	55.83	27.00		28.83
10:52:30	55.90	27.13		28.77
10:52:35	56.03	27.14		28.89
10:52:40	56.10	27.14		28.96
10:52:45	56.16	27.27		28.89
10:52:50	56.28	27.33		28.95
10:52:55	56.35	27.40		28.95
10:53:00	56.41	27.46		28.95

Table 14 (continued)

10:53:05	56.53	27.53		29.01
10:53:10	56.61	27.48		29.14
10:53:15	56.71	27.65		29.07
10:53:20	56.85	27.66		29.19
10:53:25	56.85	27.78		29.06
10:53:30	56.97	27.85		29.13
10:53:35	57.04	27.91		29.12
10:53:40	57.10	27.98		29.12
10:53:45	57.23	28.04		29.18
10:53:50	57.29	28.04		29.25
10:53:55	57.41	28.24		29.18
10:54:00	57.48	28.24		29.24
10:54:05	57.54	28.37		29.17
10:54:10	57.67	28.37		29.30
10:54:15	57.67	28.49		29.17
10:54:20	57.74	28.51		29.23
10:54:25	57.87	28.51		29.36
10:54:30	58.00	28.64		29.36
10:54:35	57.97	28.68		29.29
10:54:40	58.03	28.74		29.29
10:54:45	58.17	28.88		29.29
10:54:50	58.23	28.82		29.41
10:54:55	58.29	28.95		29.35
10:55:00	58.36	29.01		29.35
10:55:05	58.49	29.02		29.47
10:55:10	58.47	29.13		29.34
10:55:15	58.61	29.21		29.40
10:55:20	58.67	29.27		29.40
10:55:25	58.81	29.29		29.53
10:55:30	58.80	29.33		29.46
10:55:35	58.92	29.40		29.52
10:55:40	58.92	29.33		29.59
10:55:45	59.05	29.46		29.58
10:55:50	59.11	29.46		29.65
10:55:55	59.17	29.66		29.52
10:56:00	59.24	29.66		29.58
10:56:05	59.30	29.66		29.64
10:56:10	59.36	29.72		29.64
10:56:15	59.49	29.85		29.64
10:56:20	59.55	29.92		29.64
10:56:25	59.54	29.78		29.76
10:56:30	59.59	29.95		29.63
10:56:35	59.79	30.03		29.76
10:56:40	59.80	29.92		29.89
10:56:45	59.87	30.04		29.82

Table 14 (continued)

10:56:50	59.99	30.11		29.88
10:56:55	59.98	30.22		29.75
10:57:00	60.12	30.30		29.81
10:57:05	60.09	30.41		29.68
10:57:10	60.23	30.42		29.81
10:57:15	60.22	30.47		29.75
10:57:20	60.35	30.54		29.81
10:57:25	60.40	30.61		29.79
10:57:30	60.40	30.60		29.80
10:57:35	60.48	30.74		29.74
10:57:40	60.54	30.80		29.74
10:57:45	60.67	30.87		29.80
10:57:50	60.73	30.80		29.93
10:57:55	60.73	30.87		29.86
10:58:00	60.85	31.00		29.86
10:58:05	60.92	31.00		29.92
10:58:10	60.92	31.06		29.86
10:58:15	60.98	31.26		29.73
10:58:20	61.04	31.26		29.79
10:58:25	61.17	31.26		29.91
10:58:30	61.17	31.26		29.91
10:58:35	61.23	31.38		29.85
10:58:40	61.29	31.38		29.91
10:58:45	61.36	31.51		29.84
10:58:50	61.36	31.45		29.91
10:58:55	61.48	31.38		30.10
10:59:00	61.55	31.58		29.97
10:59:05	61.61	31.64		29.97
10:59:10	61.67	31.71		29.96
10:59:15	61.67	31.51		30.16
10:59:20	61.80	31.84		29.96
10:59:25	61.86	31.77		30.09
10:59:30	61.86	31.97		29.89
10:59:35	61.92	31.90		30.02
10:59:40	61.99	31.97		30.02
10:59:45	61.99	32.03		29.96
10:59:50	62.11	31.97		30.15
10:59:55	62.11	32.09		30.02
11:00:00	62.24	32.22		30.01
11:00:05	62.29	32.21		30.08
11:00:10	62.30	32.35		29.95
11:00:15	62.36	32.42		29.95
11:00:20	62.36	32.42		29.95
11:00:25	62.43	32.48		29.94
11:00:30	62.49	32.55		29.94

Table 14 (continued)

11:00:35	62.55	32.42		30.13
11:00:40	62.60	32.60		30.00
11:00:45	62.68	32.48		30.19
11:00:50	62.68	32.61		30.07
11:00:55	62.74	32.55		30.19
11:01:00	62.80	32.68		30.13
11:01:05	62.85	32.79		30.06
11:01:10	62.92	32.86		30.06
11:01:15	62.91	32.85		30.06
11:01:20	63.04	33.05		29.99
11:01:25	63.05	33.00		30.06
11:01:30	63.12	33.06		30.05
11:01:35	63.12	33.00		30.12
11:01:40	63.23	33.12		30.11
11:01:45	63.24	33.13		30.11
11:01:50	63.31	33.13		30.18
11:01:55	63.37	33.13		30.24
11:02:00	63.37	33.26		30.11
11:02:05	63.43	33.26		30.17
11:02:10	63.42	33.31		30.11
11:02:15	63.56	33.39		30.17
11:02:20	63.62	33.39		30.23
11:02:25	63.62	33.39		30.23
11:02:30	63.68	33.45		30.23
11:02:35	63.75	33.45		30.29
11:02:40	63.75	33.58		30.17
11:02:45	63.81	33.64		30.16
11:02:50	63.87	33.64		30.23
11:02:55	63.87	33.71		30.16
11:03:00	63.93	33.64		30.29
11:03:05	64.00	33.77		30.22
11:03:10	64.08	33.85		30.22
11:03:15	64.12	33.90		30.22
11:03:20	64.19	33.77		30.41
11:03:25	64.11	33.89		30.22
11:03:30	64.19	33.90		30.28
11:03:35	64.26	33.98		30.28
11:03:40	64.33	33.98		30.34

APPENDIX E

DELRIN THERMAL CONDUCTIVITY DATA

Table 15: Test Data for Uncured and 100°C Cured Delrin

Time	Ch 0	Ch 1	Ch 2	Ch 3		Temp	Temp
						Diff °C	Diff °C
	Top uncured	Bottom uncured	Bottom D100	Top D100		uncured	D100
07:51:23	22.02	27.45	26.15	22.22		5.42	3.94
07:51:29	22.02	27.45	26.15	22.22		5.42	3.94
07:51:33	22.09	27.90	26.41	22.28		5.81	4.13
07:51:38	22.02	28.41	26.74	22.22		6.39	4.52
07:51:43	22.02	28.74	27.06	22.28		6.72	4.78
07:51:48	22.09	29.12	27.38	22.22		7.04	5.17
07:51:53	22.02	29.45	27.77	22.28		7.43	5.49
07:51:58	24.73	30.09	28.03	22.28		5.36	5.75
07:52:03	22.60	30.35	28.35	22.28		7.75	6.07
07:52:08	22.39	28.59	28.59	22.26		6.20	6.33
07:52:13	22.59	30.53	29.11	26.33		7.94	2.78
07:52:18	22.39	31.17	29.63	23.23		8.78	6.39
07:52:23	22.39	31.50	29.95	22.91		9.10	7.04
07:52:28	22.33	31.82	28.40	22.78		9.49	5.62
07:52:33	22.33	32.14	27.36	22.72		9.81	4.65
07:52:38	22.31	32.39	28.83	23.54		10.07	5.29
07:52:43	22.32	31.23	32.07	23.03		8.91	9.04
07:52:48	23.54	30.96	32.84	22.83		7.43	10.01
07:52:53	22.63	32.45	33.35	22.70		9.81	10.65
07:52:58	22.51	32.97	33.74	22.63		10.46	11.11
07:53:03	22.38	33.22	34.13	22.63		10.85	11.49
07:53:08	22.42	33.40	34.44	22.55		10.98	11.88
07:53:13	22.36	33.72	34.69	22.55		11.36	12.14
07:53:18	22.36	33.92	35.02	22.55		11.56	12.46
07:53:23	22.30	34.05	35.27	22.49		11.75	12.79
07:53:28	22.30	34.24	35.47	22.49		11.95	12.98
07:53:33	22.30	34.50	35.73	22.49		12.20	13.24
07:53:38	22.30	34.69	35.92	22.49		12.40	13.43
07:53:43	22.28	34.87	36.16	22.47		12.59	13.69
07:53:48	22.28	35.00	36.36	22.47		12.72	13.88

Table 15 (continued)

07:53:53	22.28	35.19	36.55	22.47		12.91	14.08
07:53:58	22.20	35.24	36.66	22.46		13.04	14.21
07:54:03	22.28	35.45	36.81	22.47		13.17	14.33
07:54:08	22.26	35.63	37.05	22.39		13.37	14.66
07:54:13	22.26	35.76	37.11	22.46		13.50	14.66
07:54:18	22.26	35.82	37.31	22.39		13.56	14.92
07:54:23	22.33	35.95	37.37	22.46		13.62	14.92
07:54:28	22.25	36.07	37.49	22.44		13.82	15.05
07:54:33	22.25	36.07	37.55	22.44		13.82	15.11
07:54:38	22.31	36.26	37.68	22.44		13.95	15.24
07:54:43	22.25	36.39	37.87	22.44		14.14	15.43
07:54:48	22.25	36.52	38.00	22.44		14.27	15.56
07:54:53	22.23	36.57	37.99	22.42		14.33	15.56
07:54:58	22.23	36.69	38.12	22.42		14.46	15.69
07:55:03	22.23	36.82	38.31	22.42		14.59	15.88
07:55:08	22.23	36.95	38.44	22.42		14.72	16.01
07:55:13	22.23	37.08	38.63	22.42		14.85	16.21
07:55:18	22.21	37.32	38.87	22.34		15.11	16.53
07:55:23	22.21	37.45	39.00	22.41		15.24	16.59
07:55:28	22.21	37.65	39.26	22.41		15.43	16.85
07:55:33	22.21	37.84	39.33	22.41		15.63	16.92
07:55:38	22.21	37.97	39.52	22.41		15.76	17.11
07:55:43	22.20	38.08	39.70	22.33		15.88	17.37
07:55:48	22.20	38.15	39.76	22.39		15.95	17.37
07:55:53	22.26	38.34	39.95	22.39		16.08	17.56
07:55:58	22.26	38.47	40.08	22.39		16.21	17.69
07:56:03	22.25	38.52	40.20	22.44		16.27	17.76
07:56:08	22.25	38.65	40.33	22.44		16.40	17.89
07:56:13	22.31	38.84	40.46	22.38		16.53	18.08
07:56:18	22.25	38.91	40.52	22.38		16.66	18.14
07:56:23	22.23	38.89	40.57	22.36		16.66	18.21
07:56:28	22.29	39.02	40.57	22.36		16.72	18.21
07:56:33	22.29	39.08	40.63	22.36		16.79	18.27
07:56:38	22.36	39.08	40.76	22.42		16.72	18.34
07:56:43	22.29	39.28	40.89	22.42		16.98	18.47
07:56:48	22.29	39.41	40.89	22.42		17.11	18.47
07:56:53	22.28	39.39	40.94	22.41		17.11	18.53
07:56:58	22.28	39.45	41.00	22.41		17.18	18.60
07:57:03	22.28	39.52	41.07	22.47		17.24	18.60
07:57:08	22.28	39.52	41.07	22.47		17.24	18.60
07:57:13	22.33	39.50	41.05	22.46		17.18	18.60
07:57:18	22.33	39.57	41.18	22.52		17.24	18.66
07:57:23	22.39	39.70	41.25	22.46		17.31	18.79
07:57:28	22.40	39.84	41.39	22.47		17.43	18.92
07:57:33	22.39	39.89	41.50	22.52		17.50	18.98

Table 15 (continued)

07:57:38	22.37	40.07	41.62	22.50		17.69	19.11
07:57:43	22.37	40.13	41.75	22.50		17.76	19.24
07:57:48	22.37	40.26	41.88	22.50		17.89	19.37
07:57:53	22.37	40.39	42.07	22.50		18.02	19.57
07:57:58	22.37	40.52	42.13	22.50		18.14	19.63
07:58:03	22.42	40.63	42.25	22.49		18.21	19.76
07:58:08	22.44	40.84	42.39	22.57		18.40	19.82
07:58:13	22.42	40.95	42.50	22.55		18.53	19.95
07:58:18	22.49	41.02	42.63	22.55		18.53	20.08
07:58:23	22.42	41.15	42.83	22.62		18.73	20.21
07:58:28	22.55	41.21	42.89	22.62		18.66	20.28
07:58:33	22.47	41.33	42.94	22.66		18.85	20.28
07:58:38	22.54	41.39	43.00	22.60		18.85	20.40
07:58:43	22.54	41.45	43.00	22.60		18.92	20.40
07:58:48	22.60	41.58	43.20	22.66		18.98	20.53
07:58:53	22.60	41.65	43.20	22.66		19.05	20.53
07:58:58	22.60	41.71	43.33	22.66		19.11	20.66
07:59:03	22.60	41.78	43.33	22.73		19.18	20.60
07:59:08	22.66	41.78	43.33	22.79		19.11	20.53
07:59:13	22.65	41.76	43.38	22.78		19.11	20.60
07:59:18	22.65	41.76	43.38	22.71		19.11	20.66
07:59:23	22.71	41.83	43.44	22.78		19.11	20.66
07:59:28	22.65	41.96	43.57	22.78		19.31	20.79
07:59:33	22.71	42.02	43.57	22.78		19.31	20.79
07:59:38	22.71	42.08	43.70	22.78		19.37	20.92
07:59:43	22.71	42.21	43.83	22.84		19.50	20.99
07:59:48	22.78	42.28	43.89	22.84		19.50	21.05
07:59:53	22.78	42.34	43.89	22.84		19.57	21.05
07:59:58	22.84	42.34	43.89	22.84		19.50	21.05
08:00:03	22.84	42.41	43.89	22.91		19.57	20.99
08:00:08	22.84	42.34	43.89	22.91		19.50	20.99
08:00:13	22.91	42.41	43.96	22.91		19.50	21.05
08:00:18	22.84	42.47	43.96	22.97		19.63	20.99
08:00:23	22.91	42.47	43.96	22.97		19.57	20.99
08:00:28	22.91	42.60	44.15	22.97		19.69	21.18
08:00:33	22.91	42.67	44.28	22.97		19.76	21.31
08:00:38	22.97	42.79	44.47	23.04		19.82	21.44
08:00:43	22.97	42.99	44.54	23.04		20.02	21.50
08:00:48	23.04	43.05	44.67	23.10		20.02	21.57
08:00:53	23.04	43.18	44.80	23.10		20.15	21.70
08:00:58	23.04	43.31	44.86	23.04		20.28	21.83
08:01:03	23.04	43.38	44.99	23.16		20.34	21.83
08:01:08	23.10	43.57	45.18	23.16		20.47	22.02
08:01:13	23.12	43.72	45.33	23.18		20.60	22.15
08:01:18	23.18	43.84	45.39	23.25		20.66	22.15

Table 15 (continued)

08:01:23	23.25	43.84	45.39	23.25		20.60	22.15
08:01:28	23.18	43.91	45.52	23.25		20.73	22.28
08:01:33	23.18	44.04	45.52	23.25		20.86	22.28
08:01:38	23.31	44.04	45.65	23.25		20.73	22.41
08:01:43	23.25	44.17	45.72	23.31		20.92	22.41
08:01:48	23.25	44.23	45.78	23.31		20.99	22.47
08:01:53	23.31	44.30	45.91	23.37		20.99	22.54
08:01:58	23.31	44.36	45.98	23.44		21.05	22.54
08:02:03	23.37	44.43	46.04	23.37		21.05	22.66
08:02:08	23.37	44.49	46.10	23.44		21.11	22.66
08:02:13	23.44	44.55	46.17	23.37		21.11	22.79
08:02:18	23.44	44.68	46.30	23.44		21.24	22.86
08:02:23	23.44	44.75	46.30	23.50		21.31	22.79
08:02:28	23.46	44.83	46.31	23.52		21.37	22.79
08:02:33	23.46	44.76	46.31	23.58		21.31	22.73
08:02:38	23.58	44.83	46.38	23.58		21.24	22.79
08:02:43	23.58	44.76	46.25	23.65		21.18	22.60
08:02:48	23.58	44.76	46.19	23.65		21.18	22.54
08:02:53	23.58	44.70	46.19	23.65		21.11	22.54
08:02:58	23.65	44.70	46.12	23.71		21.05	22.41
08:03:03	23.65	44.64	46.06	23.71		20.99	22.34
08:03:08	23.71	44.64	45.99	23.71		20.92	22.28
08:03:13	23.65	44.64	46.06	23.65		20.99	22.41
08:03:18	23.71	44.70	46.06	23.71		20.99	22.34
08:03:23	23.78	44.70	46.12	23.78		20.92	22.34
08:03:28	23.78	44.64	46.06	23.84		20.86	22.21
08:03:33	23.79	44.72	46.14	23.86		20.92	22.28
08:03:38	23.78	44.76	46.12	23.91		20.99	22.21
08:03:43	23.84	44.76	46.31	23.84		20.92	22.47
08:03:48	23.91	44.83	46.31	23.91		20.92	22.41
08:03:53	23.91	44.83	46.31	23.91		20.92	22.41
08:03:58	23.97	44.89	46.38	23.91		20.92	22.47
08:04:03	23.97	44.96	46.44	23.91		20.99	22.54
08:04:08	23.99	45.10	46.59	23.99		21.11	22.60
08:04:13	24.04	45.22	46.70	24.04		21.18	22.66
08:04:18	24.04	45.28	46.77	24.04		21.24	22.73
08:04:23	24.04	45.41	46.90	24.10		21.37	22.79
08:04:28	24.10	45.54	47.02	24.10		21.44	22.92
08:04:33	24.10	45.67	47.09	24.10		21.57	22.99
08:04:38	24.10	45.73	47.22	24.10		21.63	23.12
08:04:43	24.17	45.80	47.35	24.17		21.63	23.18
08:04:48	24.17	45.93	47.41	24.17		21.76	23.25
08:04:53	24.23	45.99	47.41	24.17		21.76	23.25
08:04:58	24.23	45.99	47.54	24.23		21.76	23.31
08:05:03	24.23	46.06	47.61	24.23		21.83	23.38

Table 15 (continued)

08:05:08	24.30	46.12	47.61	24.30		21.83	23.31
08:05:13	24.30	46.12	47.61	24.36		21.83	23.25
08:05:18	24.30	46.12	47.61	24.36		21.83	23.25
08:05:23	24.36	46.12	47.61	24.36		21.76	23.25
08:05:28	24.41	46.10	47.59	24.41		21.70	23.18
08:05:33	24.42	46.06	47.54	24.42		21.63	23.12
08:05:38	24.42	46.06	47.54	24.42		21.63	23.12
08:05:43	24.47	46.10	47.52	24.47		21.63	23.05
08:05:48	24.54	46.17	47.65	24.47		21.63	23.18
08:05:53	24.54	46.23	47.65	24.54		21.70	23.12
08:05:58	24.54	46.30	47.78	24.54		21.76	23.25
08:06:03	24.55	46.37	47.73	24.55		21.83	23.18
08:06:08	24.54	46.04	47.40	24.54		21.50	22.86
08:06:13	24.54	45.91	47.20	24.54		21.37	22.66
08:06:18	24.60	45.85	47.20	24.60		21.24	22.60
08:06:23	24.60	45.78	47.07	24.67		21.18	22.41
08:06:28	24.67	45.78	47.07	24.60		21.11	22.47
08:06:33	24.73	45.78	47.01	24.67		21.05	22.34
08:06:38	24.74	45.73	47.02	24.74		20.99	22.28
08:06:43	24.80	45.65	47.01	24.73		20.86	22.28
08:06:48	24.78	45.70	46.99	24.78		20.92	22.21
08:06:53	24.84	45.57	46.93	24.78		20.73	22.15
08:06:58	24.84	45.64	46.93	24.78		20.79	22.15
08:07:03	24.91	45.57	46.86	24.84		20.66	22.02
08:07:08	24.84	45.57	46.86	24.84		20.73	22.02
08:07:13	24.91	45.51	46.80	24.84		20.60	21.95
08:07:18	24.91	45.51	46.80	24.91		20.60	21.89
08:07:23	24.91	45.51	46.73	24.97		20.60	21.76
08:07:28	24.96	45.43	46.72	24.96		20.47	21.76
08:07:33	24.97	45.51	46.80	24.97		20.53	21.83
08:07:38	25.02	45.49	46.78	25.02		20.47	21.76
08:07:43	25.09	45.55	46.78	25.02		20.47	21.76
08:07:48	25.09	45.55	46.85	25.02		20.47	21.83
08:07:53	25.02	45.68	46.91	25.09		20.66	21.83
08:07:58	25.15	45.75	47.04	25.15		20.60	21.89
08:08:03	25.15	45.81	47.17	25.15		20.66	22.02
08:08:08	25.21	45.94	47.30	25.15		20.73	22.15
08:08:13	25.21	46.07	47.49	25.21		20.86	22.28
08:08:18	25.28	46.46	47.88	25.28		21.18	22.60
08:08:23	25.28	46.85	48.40	25.34		21.57	23.05
08:08:28	25.28	47.17	48.85	25.28		21.89	23.57
08:08:33	25.34	47.49	49.17	25.34		22.15	23.83
08:08:38	25.33	47.80	49.48	25.39		22.47	24.09
08:08:43	25.39	48.06	49.67	25.39		22.66	24.28
08:08:48	25.39	48.32	49.99	25.46		22.92	24.54

Table 15 (continued)

08:08:53	25.48	48.54	50.21	25.42		23.05	24.80
08:08:58	25.39	48.77	50.45	25.46		23.38	24.99
08:09:03	25.52	48.96	50.64	25.52		23.44	25.12
08:09:08	25.52	49.22	50.90	25.46		23.70	25.44
08:09:13	25.52	49.41	51.09	25.46		23.89	25.64
08:09:18	25.59	49.61	51.35	25.59		24.02	25.76
08:09:23	25.65	49.80	51.54	25.59		24.15	25.96
08:09:28	25.59	49.99	51.74	25.59		24.41	26.15
08:09:33	25.65	50.19	51.93	25.59		24.54	26.35
08:09:38	25.67	50.33	52.08	25.60		24.67	26.47
08:09:43	25.65	50.45	52.25	25.72		24.80	26.54
08:09:48	25.67	50.72	52.46	25.67		25.05	26.80
08:09:53	25.72	50.77	52.51	25.72		25.05	26.79
08:09:58	25.80	50.98	52.71	25.80		25.18	26.92
08:10:03	25.80	51.04	52.78	25.80		25.25	26.98
08:10:08	25.80	51.17	52.90	25.80		25.38	27.11
08:10:13	25.78	51.22	52.95	25.78		25.44	27.17
08:10:18	25.80	51.30	53.03	25.80		25.51	27.23
08:10:23	25.93	51.43	53.15	25.86		25.51	27.29
08:10:28	25.86	51.56	53.22	25.86		25.70	27.36
08:10:33	25.93	51.62	53.28	25.93		25.70	27.35
08:10:38	25.93	51.75	53.34	25.93		25.83	27.42
08:10:43	25.99	51.82	53.47	25.93		25.83	27.54
08:10:48	25.99	51.88	53.59	25.99		25.89	27.60
08:10:53	25.99	52.01	53.66	25.99		26.02	27.67
08:10:58	26.05	52.14	53.78	25.99		26.09	27.79
08:11:03	26.05	52.14	53.78	26.05		26.09	27.73
08:11:08	26.14	52.29	53.92	26.14		26.15	27.79
08:11:13	26.14	52.35	53.99	26.14		26.22	27.85
08:11:18	26.14	52.54	54.11	26.07		26.41	28.04
08:11:23	26.21	52.55	54.19	26.15		26.34	28.04
08:11:28	26.20	52.60	54.24	26.14		26.40	28.10
08:11:33	26.26	52.73	54.36	26.20		26.47	28.16
08:11:38	26.33	52.86	54.49	26.26		26.53	28.22
08:11:43	26.26	52.86	54.55	26.26		26.59	28.29
08:11:48	26.27	52.99	54.63	26.27		26.72	28.35
08:11:53	26.33	53.04	54.68	26.26		26.71	28.41
08:11:58	26.39	53.04	54.74	26.33		26.65	28.41
08:12:03	26.39	53.23	54.80	26.33		26.84	28.47
08:12:08	26.39	53.23	54.87	26.39		26.84	28.47
08:12:13	26.33	53.30	54.93	26.33		26.97	28.60
08:12:18	26.41	53.37	55.01	26.41		26.96	28.60
08:12:23	26.47	53.44	55.07	26.35		26.96	28.73
08:12:28	26.47	53.56	55.20	26.41		27.09	28.79
08:12:33	26.47	53.69	55.32	26.47		27.21	28.85

Table 15 (continued)

08:12:38	26.47	53.75	55.45	26.54		27.28	28.91
08:12:43	26.54	53.81	55.51	26.47		27.27	29.04
08:12:48	26.54	53.94	55.57	26.54		27.40	29.03
08:12:53	26.60	54.07	55.76	26.60		27.46	29.16
08:12:58	26.60	54.13	55.82	26.67		27.52	29.16
08:13:03	26.60	54.32	56.01	26.60		27.71	29.41
08:13:08	26.60	54.38	56.14	26.60		27.78	29.54
08:13:13	26.73	54.57	56.26	26.67		27.84	29.60
08:13:18	26.73	54.63	56.39	26.67		27.90	29.72
08:13:23	26.73	54.76	56.52	26.67		28.02	29.85
08:13:28	26.73	54.88	56.58	26.73		28.15	29.85
08:13:33	26.80	54.94	56.70	26.73		28.15	29.97
08:13:38	26.80	55.07	56.77	26.73		28.27	30.03
08:13:43	26.80	55.20	56.89	26.73		28.40	30.16
08:13:48	26.86	55.26	57.02	26.73		28.40	30.29
08:13:53	26.86	55.38	57.08	26.80		28.52	30.28
08:13:58	26.93	55.51	57.21	26.86		28.58	30.35
08:14:03	26.93	55.57	57.33	26.86		28.65	30.47
08:14:08	26.93	55.70	57.40	26.86		28.77	30.53
08:14:13	26.99	55.82	57.58	26.86		28.83	30.72
08:14:18	26.93	55.89	57.71	26.86		28.96	30.85
08:14:23	26.93	56.08	57.77	26.93		29.15	30.85
08:14:28	27.06	56.14	57.90	26.99		29.08	30.91
08:14:33	27.12	56.20	57.90	26.99		29.08	30.91
08:14:38	27.12	56.26	58.02	26.99		29.14	31.03
08:14:43	27.04	56.31	58.07	27.04		29.27	31.03
08:14:48	27.12	56.39	58.15	27.06		29.27	31.09
08:14:53	27.10	56.44	58.20	27.10		29.33	31.09
08:14:58	27.17	56.50	58.26	27.10		29.33	31.16
08:15:03	27.23	56.56	58.32	27.10		29.33	31.22
08:15:08	27.17	56.63	58.38	27.17		29.46	31.22
08:15:13	27.30	56.69	58.45	27.23		29.39	31.21
08:15:18	27.36	56.75	58.51	27.23		29.39	31.28
08:15:23	27.30	56.81	58.57	27.30		29.52	31.28
08:15:28	27.36	56.88	58.57	27.23		29.51	31.34
08:15:33	27.36	56.88	58.57	27.36		29.51	31.21
08:15:38	27.35	56.86	58.62	27.28		29.52	31.34
08:15:43	27.35	56.80	58.56	27.35		29.45	31.21
08:15:48	27.41	56.80	58.49	27.35		29.39	31.15
08:15:53	27.41	56.86	58.49	27.41		29.45	31.08
08:15:58	27.47	56.86	58.49	27.41		29.39	31.08
08:16:03	27.47	56.92	58.56	27.41		29.45	31.15
08:16:08	27.52	56.97	58.60	27.39		29.45	31.21
08:16:13	27.52	57.03	58.73	27.46		29.51	31.27
08:16:18	27.52	57.10	58.79	27.52		29.57	31.27

Table 15 (continued)

08:16:23	27.65	57.16	58.86	27.52		29.51	31.33
08:16:28	27.59	57.22	58.92	27.59		29.63	31.33
08:16:33	27.65	57.22	58.92	27.59		29.57	31.33
08:16:38	27.59	57.35	59.04	27.65		29.76	31.39
08:16:43	27.72	57.41	59.04	27.65		29.69	31.39
08:16:48	27.83	57.46	59.09	27.64		29.63	31.46
08:16:53	27.77	57.46	59.09	27.64		29.69	31.46
08:16:58	27.77	57.39	59.03	27.70		29.63	31.33
08:17:03	27.83	57.33	58.97	27.70		29.50	31.27
08:17:08	27.83	57.27	58.90	27.77		29.44	31.14
08:17:13	27.77	57.22	58.85	27.77		29.44	31.08
08:17:18	27.83	57.14	58.71	27.83		29.31	30.88
08:17:23	27.88	57.06	58.64	27.81		29.19	30.82
08:17:28	27.94	57.13	58.70	27.81		29.18	30.89
08:17:33	28.01	57.19	58.82	27.81		29.18	31.01
08:17:38	27.94	57.32	58.95	27.88		29.37	31.07
08:17:43	27.94	57.38	59.08	28.01		29.44	31.07
08:17:48	27.99	57.49	59.12	27.99		29.50	31.13
08:17:53	28.06	57.49	59.19	27.99		29.43	31.19
08:17:58	28.12	57.49	59.12	28.06		29.37	31.07
08:18:03	28.12	57.49	59.12	27.99		29.37	31.13
08:18:08	28.12	57.55	59.25	28.06		29.43	31.19
08:18:13	28.17	57.66	59.29	28.10		29.49	31.19
08:18:18	28.18	57.68	59.31	28.06		29.49	31.26
08:18:23	28.23	57.66	59.23	28.10		29.43	31.13
08:18:28	28.23	57.60	59.17	28.10		29.37	31.07
08:18:33	28.23	57.60	59.29	28.17		29.37	31.13
08:18:38	28.23	57.66	59.23	28.17		29.43	31.06
08:18:43	28.36	57.66	59.23	28.23		29.30	31.00
08:18:48	28.23	57.66	59.17	28.23		29.43	30.94
08:18:53	28.36	57.60	59.17	28.30		29.24	30.87
08:18:58	28.35	57.65	59.22	28.28		29.30	30.94
08:19:03	28.36	57.72	59.29	28.30		29.36	31.00
08:19:08	28.36	57.85	59.36	28.36		29.49	31.00
08:19:13	28.48	57.84	59.42	28.36		29.36	31.06
08:19:18	28.47	57.90	59.47	28.41		29.42	31.06
08:19:23	28.47	57.90	59.47	28.47		29.42	30.99
08:19:28	28.54	57.90	59.47	28.47		29.36	30.99
08:19:33	28.60	57.96	59.47	28.47		29.36	30.99
08:19:38	28.60	57.90	59.47	28.54		29.29	30.93
08:19:43	28.73	57.77	59.40	28.54		29.04	30.87
08:19:48	28.73	57.77	59.34	28.60		29.04	30.74
08:19:53	28.78	57.76	59.33	28.59		28.97	30.74
08:19:58	28.72	57.69	59.26	28.65		28.98	30.61
08:20:03	28.78	57.69	59.20	28.72		28.91	30.48

Table 15 (continued)

08:20:08	28.78	57.69	59.20	28.72		28.91	30.48
08:20:13	28.85	57.63	59.14	28.78		28.78	30.36
08:20:18	28.91	57.57	59.14	28.78		28.66	30.36
08:20:23	28.85	57.50	59.01	28.78		28.66	30.23
08:20:28	28.97	57.50	59.07	28.85		28.53	30.23
08:20:33	28.91	57.50	59.01	28.91		28.59	30.10
08:20:38	28.91	57.50	58.95	28.91		28.59	30.04
08:20:43	29.04	57.50	58.95	28.91		28.46	30.04
08:20:48	29.04	57.44	58.95	28.91		28.40	30.04
08:20:53	29.04	57.44	58.95	28.91		28.40	30.04
08:20:58	29.04	57.44	58.89	28.97		28.40	29.91
08:21:03	29.17	57.38	58.89	29.10		28.21	29.78
08:21:08	29.23	57.38	58.89	29.04		28.14	29.85
08:21:13	29.17	57.44	58.95	29.10		28.27	29.84
08:21:18	29.17	57.57	59.14	29.04		28.40	30.10
08:21:23	29.23	57.69	59.20	29.10		28.46	30.10
08:21:28	29.30	57.82	59.45	29.10		28.52	30.35
08:21:33	29.17	57.94	59.58	29.17		28.78	30.41
08:21:38	29.25	58.15	59.72	29.18		28.90	30.53
08:21:43	29.25	58.27	59.91	29.18		29.02	30.72
08:21:48	29.37	58.39	60.03	29.24		29.02	30.78
08:21:53	29.44	58.59	60.16	29.25		29.14	30.91
08:21:58	29.38	58.71	60.35	29.38		29.33	30.97
08:22:03	29.44	58.78	60.41	29.38		29.33	31.03
08:22:08	29.44	58.84	60.54	29.38		29.40	31.16
08:22:13	29.44	58.96	60.66	29.38		29.52	31.28
08:22:18	29.44	59.03	60.72	29.38		29.58	31.35
08:22:23	29.57	59.09	60.79	29.44		29.52	31.34
08:22:28	29.52	59.17	60.80	29.39		29.65	31.41
08:22:33	29.59	59.29	60.87	29.46		29.71	31.41
08:22:38	29.65	59.23	60.93	29.46		29.58	31.47
08:22:43	29.65	59.36	60.99	29.46		29.70	31.53
08:22:48	29.65	59.42	61.05	29.52		29.77	31.53
08:22:53	29.72	59.48	61.12	29.59		29.77	31.53
08:22:58	29.67	59.56	61.20	29.54		29.89	31.66
08:23:03	29.73	59.62	61.26	29.60		29.89	31.65
08:23:08	29.80	59.69	61.32	29.60		29.89	31.72
08:23:13	29.80	59.69	61.26	29.67		29.89	31.59
08:23:18	29.88	59.64	61.27	29.69		29.76	31.59
08:23:23	29.86	59.56	61.07	29.67		29.70	31.40
08:23:28	29.86	59.62	61.13	29.67		29.76	31.46
08:23:33	29.86	59.62	61.20	29.73		29.76	31.46
08:23:38	29.89	59.71	61.29	29.76		29.82	31.52
08:23:43	30.01	59.83	61.34	29.75		29.82	31.59
08:23:48	30.01	59.83	61.34	29.81		29.82	31.52

Table 15 (continued)

08:23:53	30.07	59.83	61.46	29.88		29.76	31.58
08:23:58	30.01	59.89	61.40	29.88		29.88	31.52
08:24:03	30.01	59.96	61.46	29.81		29.95	31.65
08:24:08	30.01	59.96	61.59	29.96		29.95	31.63
08:24:13	30.09	60.03	61.60	29.90		29.94	31.71
08:24:18	30.15	60.10	61.67	30.03		29.94	31.64
08:24:23	30.15	60.16	61.73	30.03		30.01	31.71
08:24:28	30.15	60.22	61.79	29.96		30.07	31.83
08:24:33	30.15	60.29	61.86	29.96		30.13	31.90
08:24:38	30.22	60.35	61.92	30.03		30.13	31.89
08:24:43	30.30	60.43	62.00	30.17		30.13	31.83
08:24:48	30.30	60.43	62.06	30.17		30.13	31.89
08:24:53	30.36	60.49	62.06	30.17		30.13	31.89
08:24:58	30.36	60.55	62.19	30.17		30.19	32.02
08:25:03	30.30	60.62	62.19	30.17		30.32	32.02
08:25:08	30.36	60.62	62.25	30.17		30.25	32.08
08:25:13	30.49	60.68	62.31	30.17		30.18	32.14
08:25:18	30.43	60.74	62.37	30.24		30.31	32.14
08:25:23	30.45	60.82	62.45	30.32		30.37	32.14
08:25:28	30.51	60.88	62.45	30.32		30.37	32.14
08:25:33	30.51	60.95	62.52	30.32		30.44	32.20
08:25:38	30.57	60.95	62.58	30.32		30.37	32.26
08:25:43	30.57	61.01	62.58	30.32		30.43	32.26
08:25:48	30.57	61.01	62.58	30.38		30.43	32.20
08:25:53	30.57	61.07	62.64	30.38		30.50	32.26
08:25:58	30.64	61.07	62.70	30.38		30.43	32.32
08:26:03	30.70	61.20	62.83	30.45		30.49	32.39
08:26:08	30.57	61.26	62.89	30.45		30.69	32.45
08:26:13	30.64	61.26	62.96	30.45		30.62	32.51
08:26:18	30.70	61.39	62.96	30.45		30.68	32.51
08:26:23	30.70	61.39	63.02	30.45		30.68	32.57
08:26:28	30.70	61.45	63.08	30.57		30.74	32.51
08:26:33	30.83	61.45	63.08	30.57		30.62	32.51
08:26:38	30.70	61.51	63.08	30.57		30.81	32.51
08:26:43	30.77	61.45	63.02	30.57		30.68	32.44
08:26:48	30.83	61.51	63.14	30.57		30.68	32.57
08:26:53	30.83	61.51	63.08	30.70		30.68	32.38
08:26:58	30.83	61.51	63.08	30.70		30.68	32.38
08:27:03	30.83	61.57	63.21	30.70		30.74	32.50
08:27:08	30.90	61.51	63.14	30.77		30.61	32.38
08:27:13	30.97	61.52	63.16	30.78		30.55	32.38
08:27:18	31.03	61.51	63.14	30.77		30.48	32.38
08:27:23	30.96	61.57	63.21	30.70		30.61	32.50
08:27:28	30.96	61.64	63.27	30.77		30.67	32.50
08:27:33	30.96	61.70	63.27	30.77		30.74	32.50

Table 15 (continued)

08:27:38	30.90	61.76	63.33	30.77		30.86	32.56
08:27:43	31.03	61.70	63.27	30.77		30.67	32.50
08:27:48	30.96	61.70	63.27	30.83		30.74	32.44
08:27:53	31.09	61.57	63.14	30.77		30.48	32.38
08:27:58	31.09	61.57	63.08	30.83		30.48	32.25
08:28:03	31.16	61.45	63.02	30.90		30.29	32.12
08:28:08	31.16	61.45	62.96	30.96		30.29	31.99
08:28:13	31.16	61.39	62.89	30.96		30.23	31.93
08:28:18	31.22	61.32	62.83	30.96		30.10	31.87
08:28:23	31.22	61.32	62.83	30.90		30.10	31.93
08:28:28	31.16	61.26	62.77	30.96		30.10	31.81
08:28:33	31.22	61.26	62.70	30.96		30.04	31.74
08:28:38	31.22	61.20	62.70	31.09		29.98	31.61
08:28:43	31.28	61.20	62.64	31.03		29.91	31.62
08:28:48	31.34	61.25	62.70	31.08		29.91	31.61
08:28:53	31.33	61.24	62.75	31.07		29.91	31.68
08:28:58	31.40	61.31	62.81	31.07		29.91	31.74
08:29:03	31.40	61.37	62.88	31.14		29.97	31.74
08:29:08	31.40	61.43	63.00	31.20		30.03	31.80
08:29:13	31.40	61.49	63.00	31.14		30.10	31.86
08:29:18	31.46	61.62	63.13	31.20		30.16	31.92
08:29:23	31.46	61.62	63.19	31.20		30.16	31.99
08:29:28	31.40	61.68	63.32	31.20		30.29	32.11
08:29:33	31.46	61.81	63.38	31.27		30.35	32.11
08:29:38	31.53	61.87	63.38	31.27		30.35	32.11
08:29:43	31.46	61.87	63.44	31.33		30.41	32.11
08:29:48	31.45	61.92	63.49	31.32		30.47	32.17
08:29:53	31.57	61.86	63.49	31.25		30.28	32.24
08:29:58	31.57	61.98	63.49	31.32		30.41	32.17
08:30:03	31.57	61.98	63.55	31.38		30.41	32.17
08:30:08	31.70	62.04	63.55	31.32		30.34	32.24
08:30:13	31.64	62.11	63.62	31.45		30.47	32.17
08:30:18	31.70	62.11	63.74	31.51		30.40	32.23
08:30:23	31.64	62.17	63.74	31.45		30.53	32.30
08:30:28	31.77	62.23	63.87	31.51		30.46	32.36
08:30:33	31.77	62.30	63.87	31.45		30.53	32.42
08:30:38	31.83	62.36	63.93	31.57		30.53	32.35
08:30:43	31.83	62.42	63.99	31.50		30.59	32.48
08:30:48	31.77	62.48	63.99	31.57		30.72	32.42
08:30:53	31.83	62.48	64.06	31.64		30.65	32.42
08:30:58	31.82	62.53	64.10	31.62		30.71	32.48
08:31:03	31.90	62.55	64.06	31.57		30.65	32.48
08:31:08	31.95	62.53	64.10	31.69		30.59	32.41
08:31:13	31.95	62.53	64.10	31.75		30.59	32.35
08:31:18	32.02	62.48	64.05	31.76		30.46	32.29

Table 15 (continued)

08:31:23	32.08	62.47	63.98	31.75		30.39	32.22
08:31:28	32.08	62.47	63.91	31.69		30.39	32.23
08:31:33	31.95	62.47	63.98	31.75		30.52	32.22
08:31:38	32.01	62.47	63.98	31.75		30.46	32.22
08:31:43	32.01	62.41	63.91	31.75		30.40	32.16
08:31:48	32.08	62.47	63.91	31.75		30.39	32.16
08:31:53	32.08	62.34	63.91	31.75		30.27	32.16
08:31:58	32.14	62.41	63.85	31.95		30.27	31.90
08:32:03	32.14	62.34	63.79	31.88		30.20	31.91
08:32:08	32.14	62.34	63.91	31.88		30.20	32.03
08:32:13	32.14	62.41	63.91	31.88		30.27	32.03
08:32:18	32.20	62.41	63.91	32.01		30.20	31.90
08:32:23	32.14	62.47	63.98	31.95		30.33	32.03
08:32:28	32.27	62.53	64.04	32.08		30.26	31.96
08:32:33	32.27	62.59	64.10	31.95		30.33	32.16
08:32:38	32.33	62.66	64.10	32.08		30.32	32.03
08:32:43	32.33	62.66	64.10	32.08		30.32	32.03
08:32:48	32.27	62.72	64.17	32.01		30.45	32.15
08:32:53	32.28	62.73	64.24	32.02		30.45	32.22
08:32:58	32.40	62.72	64.29	32.01		30.32	32.28
08:33:03	32.33	62.78	64.29	32.08		30.45	32.22
08:33:08	32.40	62.85	64.35	32.14		30.45	32.21
08:33:13	32.46	62.91	64.42	32.14		30.45	32.28
08:33:18	32.46	62.97	64.42	32.20		30.51	32.21
08:33:23	32.46	63.03	64.48	32.20		30.57	32.28
08:33:28	32.27	62.97	64.48	32.20		30.70	32.28
08:33:33	32.40	63.03	64.60	32.20		30.64	32.40
08:33:38	32.53	63.10	64.60	32.20		30.57	32.40
08:33:43	32.46	63.16	64.67	32.20		30.70	32.46
08:33:48	32.59	63.22	64.73	32.27		30.63	32.46
08:33:53	32.66	63.29	64.79	32.33		30.63	32.46
08:33:58	32.66	63.35	64.86	32.33		30.69	32.52
08:34:03	32.61	63.43	64.87	32.29		30.82	32.59
08:34:08	32.54	63.49	64.93	32.35		30.95	32.59
08:34:13	32.74	63.49	65.06	32.48		30.75	32.58
08:34:18	32.74	63.62	65.06	32.41		30.88	32.65
08:34:23	32.80	63.62	65.12	32.48		30.81	32.64
08:34:28	32.74	63.68	65.19	32.48		30.94	32.71
08:34:33	32.67	63.74	65.25	32.41		31.07	32.83
08:34:38	32.80	63.80	65.31	32.48		31.00	32.83
08:34:43	32.74	63.80	65.31	32.54		31.07	32.77
08:34:48	32.80	63.87	65.37	32.54		31.07	32.83
08:34:53	32.74	63.80	65.37	32.48		31.07	32.90
08:34:58	32.80	63.80	65.31	32.48		31.00	32.83
08:35:03	32.87	63.87	65.44	32.67		31.00	32.77

Table 15 (continued)

08:35:08	33.01	63.94	65.39	32.62		30.93	32.77
08:35:13	32.88	63.95	65.52	32.56		31.06	32.96
08:35:18	32.95	64.01	65.45	32.56		31.06	32.89
08:35:23	32.95	64.01	65.52	32.62		31.06	32.89
08:35:28	32.95	64.07	65.58	32.62		31.12	32.95
08:35:33	33.01	64.07	65.64	32.69		31.06	32.95
08:35:38	32.88	64.20	65.70	32.69		31.31	33.02
08:35:43	32.88	64.20	65.70	32.56		31.31	33.15
08:35:48	32.95	64.13	65.64	32.75		31.19	32.89
08:35:53	33.08	64.20	65.64	32.75		31.12	32.89
08:35:58	32.82	64.20	65.70	32.69		31.38	33.02
08:36:03	32.96	64.22	65.73	32.78		31.26	32.95
08:36:08	33.08	64.20	65.64	32.82		31.12	32.82
08:36:13	33.01	64.13	65.64	32.88		31.12	32.76
08:36:18	33.08	64.13	65.64	32.82		31.06	32.82
08:36:23	33.14	64.20	65.58	32.82		31.06	32.76
08:36:28	33.08	64.13	65.58	32.95		31.06	32.63
08:36:33	33.21	64.13	65.64	32.82		30.93	32.82
08:36:38	33.14	64.20	65.64	32.82		31.06	32.82
08:36:43	33.08	64.26	65.70	32.82		31.18	32.89
08:36:48	33.21	64.26	65.77	32.88		31.05	32.89
08:36:53	33.21	64.32	65.83	32.82		31.12	33.01
08:36:58	33.33	64.39	65.89	32.88		31.05	33.01
08:37:03	33.27	64.45	65.96	32.95		31.18	33.01
08:37:08	33.21	64.45	66.02	32.95		31.24	33.07
08:37:13	33.08	64.51	66.02	32.88		31.43	33.14
08:37:18	33.21	64.57	66.08	33.01		31.37	33.07
08:37:23	33.27	64.64	66.14	33.01		31.37	33.13
08:37:28	33.27	64.64	66.14	33.01		31.37	33.13
08:37:33	33.40	64.64	66.14	33.08		31.24	33.07
08:37:38	33.46	64.57	66.08	33.01		31.11	33.07
08:37:43	33.33	64.57	66.02	33.08		31.24	32.94
08:37:48	33.46	64.57	66.02	33.14		31.11	32.88
08:37:53	33.46	64.45	65.96	33.08		30.98	32.88
08:37:58	33.40	64.45	65.89	33.14		31.05	32.75
08:38:03	33.46	64.39	65.83	33.21		30.92	32.63
08:38:08	33.53	64.26	65.70	33.21		30.73	32.50
08:38:13	33.59	64.26	65.70	33.21		30.67	32.50
08:38:18	33.53	64.20	65.58	33.27		30.67	32.31
08:38:23	33.59	64.13	65.58	33.40		30.54	32.18
08:38:28	33.66	64.13	65.52	33.33		30.48	32.18
08:38:33	33.59	64.07	65.52	33.27		30.48	32.25
08:38:38	33.59	64.01	65.45	33.27		30.42	32.18
08:38:43	33.59	64.01	65.39	33.27		30.42	32.12
08:38:48	33.59	63.95	65.39	33.33		30.35	32.06

Table 15 (continued)

08:38:53	33.66	63.88	65.33	33.33		30.23	31.99
08:38:58	33.66	63.88	65.26	33.33		30.23	31.93
08:39:03	33.72	63.88	65.26	33.40		30.16	31.87
08:39:08	33.72	63.76	65.14	33.33		30.03	31.80
08:39:13	33.59	63.76	65.20	33.40		30.16	31.80
08:39:18	33.79	63.69	65.14	33.40		29.91	31.74
08:39:23	33.64	63.68	65.06	33.45		30.04	31.61
08:39:28	33.72	63.69	65.08	33.46		29.97	31.61
08:39:33	33.79	63.69	65.01	33.53		29.91	31.49
08:39:38	33.77	63.55	64.93	33.38		29.78	31.55
08:39:43	33.83	63.55	64.93	33.51		29.72	31.42
08:39:48	33.71	63.62	64.93	33.58		29.91	31.36
08:39:53	33.90	63.55	64.93	33.58		29.65	31.36
08:39:58	33.71	63.49	64.93	33.45		29.78	31.49
08:40:03	33.71	63.55	64.93	33.58		29.85	31.36
08:40:08	33.69	63.54	64.86	33.62		29.85	31.23
08:40:13	33.84	63.50	64.82	33.52		29.66	31.30
08:40:18	33.82	63.47	64.86	33.50		29.66	31.36
08:40:23	33.88	63.47	64.79	33.50		29.59	31.30
08:40:28	33.75	63.41	64.79	33.56		29.66	31.23
08:40:33	33.76	63.42	64.80	33.57		29.66	31.23
08:40:38	33.88	63.35	64.73	33.62		29.47	31.11
08:40:43	33.88	63.35	64.67	33.62		29.47	31.04
08:40:48	33.96	63.30	64.74	33.70		29.34	31.04
08:40:53	33.95	63.35	64.67	33.69		29.40	30.98
08:40:58	33.76	63.30	64.68	33.70		29.53	30.98
08:41:03	33.74	63.40	64.71	33.67		29.66	31.04
08:41:08	33.87	63.46	64.84	33.61		29.59	31.23
08:41:13	33.87	63.52	64.90	33.67		29.65	31.23
08:41:18	33.88	63.59	65.04	33.75		29.72	31.29

Table 16: Test Data for 200°C Cured Delrin

Time	Ch 0	Ch 1	Temp
	Top	Bottom	Diff °C
	D 200	D 200	D 200
08:57:28	23.74	24.13	0.39
08:57:33	23.68	24.20	0.52
08:57:38	23.66	24.50	0.84
08:57:43	23.66	24.83	1.16
08:57:48	23.66	25.21	1.55
08:57:53	23.66	25.67	2.00
08:57:58	23.60	26.12	2.52
08:58:03	23.67	26.58	2.91
08:58:08	23.67	26.97	3.29
08:58:13	23.66	27.47	3.81
08:58:18	23.67	27.94	4.26
08:58:23	23.61	28.32	4.71
08:58:28	23.67	28.71	5.04
08:58:33	23.61	29.10	5.49
08:58:38	23.59	29.47	5.88
08:58:43	23.58	29.91	6.33
08:58:48	23.65	30.36	6.72
08:58:53	23.65	30.69	7.04
08:58:58	23.65	31.07	7.43
08:59:03	23.65	31.46	7.81
08:59:08	23.65	31.78	8.14
08:59:13	23.66	32.05	8.39
08:59:18	23.65	32.36	8.72
08:59:23	23.63	32.61	8.98
08:59:28	23.65	33.01	9.36
08:59:33	23.63	33.32	9.69
08:59:38	23.63	33.57	9.94
08:59:43	23.70	33.90	10.20
08:59:48	23.63	34.29	10.65
08:59:53	23.63	34.61	10.98
08:59:58	23.63	34.87	11.24
09:00:03	23.63	35.25	11.62
09:00:08	23.63	35.45	11.82
09:00:13	23.68	35.75	12.07
09:00:18	23.69	36.02	12.33
09:00:23	23.68	36.27	12.59
09:00:28	23.61	36.59	12.98
09:00:33	23.68	36.79	13.11
09:00:38	23.68	37.05	13.37
09:00:43	23.68	37.24	13.56
09:00:48	23.68	37.56	13.88
09:00:53	23.66	37.74	14.08

Table 16 (continued)

09:00:58	23.66	37.93		14.27
09:01:03	23.66	38.19		14.53
09:01:08	23.68	38.40		14.72
09:01:13	23.66	38.64		14.98
09:01:18	23.66	38.84		15.17
09:01:23	23.66	39.10		15.43
09:01:28	23.66	39.29		15.63
09:01:33	23.73	39.55		15.82
09:01:38	23.66	39.87		16.21
09:01:43	23.65	39.98		16.34
09:01:48	23.65	40.24		16.59
09:01:53	23.71	40.44		16.72
09:01:58	23.66	40.71		17.05
09:02:03	23.65	40.82		17.18
09:02:08	23.71	41.02		17.31
09:02:13	23.72	41.22		17.50
09:02:18	23.72	41.41		17.69
09:02:23	23.72	41.54		17.82
09:02:28	23.71	41.73		18.02
09:02:33	23.71	41.86		18.14
09:02:38	23.71	41.98		18.27
09:02:43	23.78	42.05		18.27
09:02:48	23.79	42.12		18.34
09:02:53	23.78	42.24		18.47
09:02:58	23.78	42.31		18.53
09:03:03	23.78	42.37		18.60
09:03:08	23.78	42.44		18.66
09:03:13	23.79	42.52		18.73
09:03:18	23.78	42.63		18.85
09:03:23	23.85	42.64		18.79
09:03:28	23.85	42.77		18.92
09:03:33	23.84	42.82		18.98
09:03:38	23.84	42.89		19.05
09:03:43	23.84	42.95		19.11
09:03:48	23.91	43.16		19.24
09:03:53	23.84	43.21		19.37
09:03:58	23.98	43.29		19.31
09:04:03	24.00	43.43		19.44
09:04:08	23.97	43.53		19.57
09:04:13	23.97	43.66		19.69
09:04:18	23.98	43.80		19.82
09:04:23	23.97	43.86		19.89
09:04:28	24.05	43.94		19.89
09:04:33	23.99	44.07		20.08
09:04:38	24.04	44.13		20.08

Table 16 (continued)

09:04:43	23.97	44.18		20.21
09:04:48	24.03	44.31		20.28
09:04:53	24.11	44.39		20.28
09:04:58	24.12	44.53		20.41
09:05:03	24.05	44.65		20.60
09:05:08	24.10	44.70		20.60
09:05:13	24.16	44.83		20.66
09:05:18	24.18	44.97		20.79
09:05:23	24.19	45.05		20.86
09:05:28	24.24	45.17		20.92
09:05:33	24.17	45.29		21.12
09:05:38	24.23	45.41		21.18
09:05:43	24.29	45.54		21.24
09:05:48	24.30	45.68		21.37
09:05:53	24.29	45.73		21.44
09:05:58	24.29	45.92		21.63
09:06:03	24.29	45.99		21.70
09:06:08	24.36	46.12		21.76
09:06:13	24.36	46.31		21.95
09:06:18	24.36	46.38		22.02
09:06:23	24.42	46.57		22.15
09:06:28	24.49	46.57		22.08
09:06:33	24.42	46.57		22.15
09:06:38	24.49	46.63		22.15
09:06:43	24.55	46.76		22.21
09:06:48	24.57	46.72		22.15
09:06:53	24.62	46.77		22.15
09:06:58	24.56	46.77		22.21
09:07:03	24.62	46.83		22.21
09:07:08	24.70	46.84		22.15
09:07:13	24.68	46.96		22.28
09:07:18	24.62	47.02		22.41
09:07:23	24.76	47.04		22.28
09:07:28	24.74	47.02		22.28
09:07:33	24.76	47.04		22.28
09:07:38	24.74	47.09		22.34
09:07:43	24.83	47.10		22.28
09:07:48	24.83	47.17		22.34
09:07:53	24.89	47.30		22.41
09:07:58	24.90	47.24		22.34
09:08:03	24.94	47.34		22.41
09:08:08	24.95	47.35		22.41
09:08:13	24.95	47.42		22.47
09:08:18	24.94	47.41		22.47
09:08:23	25.02	47.43		22.41

Table 16 (continued)

09:08:28	25.08	47.49		22.41
09:08:33	25.08	47.49		22.41
09:08:38	25.08	47.62		22.54
09:08:43	25.16	47.69		22.54
09:08:48	25.13	47.73		22.60
09:08:53	25.15	47.88		22.73
09:08:58	25.22	48.02		22.79
09:09:03	25.27	48.00		22.73
09:09:08	25.26	48.12		22.86
09:09:13	25.26	48.12		22.86
09:09:18	25.27	48.19		22.92
09:09:23	25.34	48.26		22.92
09:09:28	25.39	48.25		22.86
09:09:33	25.39	48.25		22.86
09:09:38	25.39	48.31		22.92
09:09:43	25.45	48.31		22.86
09:09:48	25.45	48.38		22.92
09:09:53	25.52	48.38		22.86
09:09:58	25.58	48.38		22.79
09:10:03	25.59	48.45		22.86
09:10:08	25.65	48.51		22.86
09:10:13	25.58	48.57		22.99
09:10:18	25.71	48.64		22.92
09:10:23	25.65	48.76		23.12
09:10:28	25.71	48.83		23.12
09:10:33	25.71	48.89		23.18
09:10:38	25.78	48.96		23.18
09:10:43	25.78	49.02		23.25
09:10:48	25.84	49.02		23.18
09:10:53	25.84	49.02		23.18
09:10:58	25.91	49.02		23.12
09:11:03	25.92	49.10		23.18
09:11:08	25.92	49.16		23.25
09:11:13	26.04	49.22		23.18
09:11:18	26.05	49.29		23.25
09:11:23	26.04	49.41		23.38
09:11:28	26.04	49.48		23.44
09:11:33	26.10	49.60		23.50
09:11:38	26.16	49.73		23.57
09:11:43	26.16	49.80		23.63
09:11:48	26.16	49.93		23.76
09:11:53	26.23	49.99		23.76
09:11:58	26.24	50.07		23.83
09:12:03	26.17	50.20		24.02
09:12:08	26.24	50.26		24.02

Table 16 (continued)

09:12:13	26.29	50.31		24.02
09:12:18	26.36	50.38		24.02
09:12:23	26.36	50.51		24.15
09:12:28	26.42	50.57		24.15
09:12:33	26.44	50.65		24.21
09:12:38	26.50	50.72		24.21
09:12:43	26.49	50.83		24.34
09:12:48	26.50	50.91		24.41
09:12:53	26.64	50.99		24.34
09:12:58	26.64	51.05		24.41
09:13:03	26.63	51.04		24.41
09:13:08	26.64	51.18		24.54
09:13:13	26.71	51.25		24.54
09:13:18	26.71	51.31		24.60
09:13:23	26.70	51.36		24.67
09:13:28	26.76	51.49		24.73
09:13:33	26.76	51.56		24.80
09:13:38	26.83	51.56		24.73
09:13:43	26.83	51.69		24.86
09:13:48	26.83	51.75		24.92
09:13:53	26.89	51.82		24.92
09:13:58	26.89	51.88		24.99
09:14:03	26.96	51.95		24.99
09:14:08	26.96	52.01		25.05
09:14:13	27.03	52.15		25.12
09:14:18	27.02	52.20		25.18
09:14:23	27.05	52.36		25.31
09:14:28	27.10	52.41		25.31
09:14:33	27.11	52.49		25.38
09:14:38	27.18	52.49		25.31
09:14:43	27.10	52.60		25.50
09:14:48	27.17	52.66		25.50
09:14:53	27.23	52.73		25.50
09:14:58	27.23	52.79		25.56
09:15:03	27.23	52.85		25.62
09:15:08	27.23	52.92		25.69
09:15:13	27.30	52.98		25.68
09:15:18	27.38	53.06		25.68
09:15:23	27.38	53.18		25.81
09:15:28	27.45	53.26		25.81
09:15:33	27.38	53.31		25.93
09:15:38	27.70	54.06		26.36
09:15:43	27.63	54.31		26.68
09:15:48	27.57	54.57		27.00
09:15:53	27.57	54.63		27.06

Table 16 (continued)

09:15:58	27.66	54.78		27.12
09:16:03	27.63	54.82		27.18
09:16:08	27.59	54.90		27.31
09:16:13	27.70	54.94		27.24
09:16:18	27.72	55.08		27.37
09:16:23	27.72	55.08		27.37
09:16:28	27.73	55.09		27.37
09:16:33	27.78	55.08		27.30
09:16:38	27.78	55.08		27.30
09:16:43	27.85	55.16		27.30
09:16:48	27.78	55.21		27.43
09:16:53	27.91	55.21		27.30
09:16:58	27.91	55.34		27.43
09:17:03	27.91	55.40		27.49
09:17:08	27.98	55.41		27.43
09:17:13	27.99	55.48		27.49
09:17:18	28.00	55.42		27.42
09:17:23	28.05	55.41		27.36
09:17:28	28.05	55.35		27.30
09:17:33	28.12	55.35		27.23
09:17:38	28.12	55.35		27.23
09:17:43	28.12	55.23		27.11
09:17:48	28.12	55.16		27.04
09:17:53	28.18	55.16		26.98
09:17:58	28.18	55.10		26.92
09:18:03	28.25	54.97		26.73
09:18:08	28.26	55.05		26.79
09:18:13	28.31	54.97		26.66
09:18:18	28.31	54.97		26.66
09:18:23	28.31	54.91		26.60
09:18:28	28.31	54.91		26.60
09:18:33	28.31	54.85		26.54
09:18:38	28.44	54.85		26.41
09:18:43	28.44	54.85		26.41
09:18:48	28.51	54.91		26.41
09:18:53	28.44	54.91		26.47
09:18:58	28.49	54.96		26.47
09:19:03	28.57	55.04		26.47
09:19:08	28.49	55.08		26.59
09:19:13	28.55	55.15		26.59
09:19:18	28.64	55.29		26.65
09:19:23	28.70	55.35		26.65
09:19:28	28.71	55.42		26.71
09:19:33	28.76	55.54		26.78
09:19:38	28.76	55.54		26.78

Table 16 (continued)

09:19:43	28.70	55.67		26.97
09:19:48	28.76	55.67		26.90
09:19:53	28.83	55.73		26.90
09:19:58	28.83	55.73		26.90
09:20:03	28.81	55.78		26.96
09:20:08	28.90	55.86		26.96
09:20:13	28.89	55.85		26.96
09:20:18	28.95	55.91		26.96
09:20:23	28.96	55.92		26.96
09:20:28	28.96	55.98		27.02
09:20:33	28.94	56.09		27.15
09:20:38	29.02	56.04		27.02
09:20:43	29.07	56.09		27.02
09:20:48	29.09	56.17		27.08
09:20:53	29.14	56.22		27.08
09:20:58	29.15	56.23		27.08
09:21:03	29.22	56.23		27.01
09:21:08	29.20	56.34		27.14
09:21:13	29.22	56.36		27.14
09:21:18	29.22	56.36		27.14
09:21:23	29.28	56.23		26.95
09:21:28	29.33	56.28		26.95
09:21:33	29.33	56.28		26.95
09:21:38	29.35	56.23		26.89
09:21:43	29.48	56.23		26.76
09:21:48	29.41	56.17		26.76
09:21:53	29.46	56.09		26.63
09:21:58	29.49	56.18		26.69
09:22:03	29.52	56.09		26.57
09:22:08	29.52	56.09		26.57
09:22:13	29.60	56.04		26.44
09:22:18	29.54	56.04		26.50
09:22:23	29.60	56.04		26.44
09:22:28	29.59	55.96		26.38
09:22:33	29.66	56.04		26.37
09:22:38	29.65	56.03		26.37
09:22:43	29.65	56.03		26.37
09:22:48	29.65	56.03		26.37
09:22:53	29.72	56.03		26.31
09:22:58	29.79	56.10		26.31
09:23:03	29.80	56.11		26.31
09:23:08	29.78	56.09		26.31
09:23:13	29.85	56.15		26.31
09:23:18	29.85	56.22		26.37
09:23:23	29.91	56.28		26.37

Table 16 (continued)

09:23:28	29.91	56.40		26.49
09:23:33	29.85	56.47		26.62
09:23:38	29.91	56.59		26.68
09:23:43	29.98	56.66		26.68
09:23:48	29.98	56.72		26.74
09:23:53	29.98	56.72		26.74
09:23:58	29.99	56.85		26.87
09:24:03	30.10	56.78		26.68
09:24:08	30.10	56.72		26.61
09:24:13	30.10	56.66		26.55
09:24:18	30.10	56.66		26.55
09:24:23	30.17	56.53		26.36
09:24:28	30.23	56.53		26.30
09:24:33	30.23	56.47		26.23
09:24:38	30.23	56.47		26.23
09:24:43	30.23	56.40		26.17
09:24:48	30.30	56.40		26.11
09:24:53	30.23	56.40		26.17
09:24:58	30.36	56.40		26.04
09:25:03	30.30	56.47		26.17
09:25:08	30.30	56.40		26.11
09:25:13	30.36	56.47		26.10
09:25:18	30.43	56.53		26.10
09:25:23	30.43	56.53		26.10
09:25:28	30.43	56.53		26.10
09:25:33	30.36	56.53		26.17
09:25:38	30.43	56.40		25.98
09:25:43	30.36	56.40		26.04
09:25:48	30.43	56.40		25.98
09:25:53	30.56	56.34		25.78
09:25:58	30.50	56.35		25.85
09:26:03	30.56	56.40		25.85
09:26:08	30.56	56.40		25.85
09:26:13	30.62	56.53		25.91
09:26:18	30.62	56.59		25.97
09:26:23	30.62	56.66		26.03
09:26:28	30.62	56.78		26.16
09:26:33	30.69	56.84		26.16
09:26:38	30.62	56.97		26.35
09:26:43	30.75	56.97		26.22
09:26:48	30.75	57.03		26.28
09:26:53	30.75	56.91		26.16
09:26:58	30.88	56.84		25.96
09:27:03	30.81	56.78		25.97
09:27:08	30.81	56.78		25.97

Table 16 (continued)

09:27:13	30.88	56.66		25.78
09:27:18	30.88	56.72		25.84
09:27:23	30.93	56.70		25.77
09:27:28	30.99	56.70		25.71
09:27:33	30.93	56.64		25.71
09:27:38	30.99	56.64		25.65
09:27:43	30.99	56.70		25.71
09:27:48	30.99	56.83		25.84
09:27:53	30.99	56.89		25.90
09:27:58	30.99	57.02		26.02
09:28:03	30.98	57.13		26.15
09:28:08	31.06	57.27		26.21
09:28:13	31.06	57.39		26.34
09:28:18	31.10	57.57		26.46
09:28:23	31.17	57.63		26.46
09:28:28	31.11	57.76		26.65
09:28:33	31.11	57.83		26.71
09:28:38	31.17	57.94		26.77
09:28:43	31.23	58.01		26.77
09:28:48	31.23	58.01		26.77
09:28:53	31.28	58.12		26.83
09:28:58	31.28	58.18		26.90
09:29:03	31.28	58.24		26.96
09:29:08	31.22	58.37		27.15
09:29:13	31.28	58.37		27.08
09:29:18	31.36	58.44		27.08
09:29:23	31.35	58.49		27.15
09:29:28	31.40	58.54		27.14
09:29:33	31.41	58.62		27.21
09:29:38	31.35	58.68		27.33
09:29:43	31.42	58.69		27.27
09:29:48	31.34	58.74		27.40
09:29:53	31.41	58.80		27.40
09:29:58	31.40	58.79		27.40
09:30:03	31.46	58.73		27.27
09:30:08	31.46	58.67		27.21
09:30:13	31.46	58.73		27.27
09:30:18	31.51	58.52		27.02
09:30:23	31.59	58.60		27.01
09:30:28	31.57	58.65		27.08
09:30:33	31.59	58.73		27.14
09:30:38	31.57	58.71		27.14
09:30:43	31.57	58.77		27.20
09:30:48	31.57	58.84		27.27
09:30:53	31.64	58.90		27.26

Table 16 (continued)

09:30:58	31.57	58.96		27.39
09:31:03	31.64	58.90		27.26
09:31:08	31.62	58.95		27.33
09:31:13	31.56	59.01		27.45
09:31:18	31.69	58.95		27.26
09:31:23	31.69	58.88		27.20
09:31:28	31.69	58.82		27.14
09:31:33	31.81	58.88		27.07
09:31:38	31.75	58.82		27.07
09:31:43	31.76	58.71		26.95
09:31:48	31.81	58.76		26.94
09:31:53	31.75	58.63		26.88
09:31:58	31.81	58.63		26.82
09:32:03	31.89	58.52		26.63
09:32:08	31.88	58.57		26.69
09:32:13	31.88	58.51		26.63
09:32:18	31.95	58.46		26.50
09:32:23	31.88	58.38		26.50
09:32:28	31.94	58.32		26.38
09:32:33	32.03	58.28		26.25
09:32:38	31.90	58.21		26.31
09:32:43	31.96	58.15		26.19
09:32:48	31.96	58.08		26.12
09:32:53	32.02	58.08		26.06
09:32:58	32.02	58.02		26.00
09:33:03	32.04	57.97		25.93
09:33:08	32.12	57.92		25.81
09:33:13	32.11	57.91		25.81
09:33:18	32.04	57.85		25.81
09:33:23	32.12	57.80		25.68

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